ISE MNU Student Research Review №2

International School of Economics MNU

The mission of the International School of Economics of MNU (ISE MNU) is to unlock the potential of its students by continuously improving the academic quality of the programs through integrating into international education, research and business community, and professional development.

ISE MNU delivers 11 undergraduate and graduate-level academic programs entirely taught in English in the area of Economics, Business, and International Relations. The three traditional programs - 'Finance', 'Accounting' and 'Economics' - are ranked #1 in Kazakhstan according to the Rating of the Kazakhstan National Chamber of Entrepreneurs "Atameken", while 'Management' appears in the top-5 among Kazakhstani HEIs. 86% of the ISE MNU graduates find a job within three months after graduation; every fourth graduate is employed by Big4.

ISE programs are accredited by ACCA, CIMA, ICAEW, GARP FRM, and aPHRi; 'Finance' is the only program in Kazakhstan holding affiliation with the CFA Institute for the Bachelor and Master levels.

The faculty is represented by the graduates of recognized international universities; around 30% of the academic staff are industry professionals and holders of international professional certifications (CFA, ACCA, CIMA, CIPD, PMI, and others).

The rest of the faculty are researchers who publish their articles in international peer-reviewed journals such as Education Economics, Higher Education, Eurasian Geography and Economics, Open Public Health Journal, Journal of Eurasian Studies, Peace Economics, Peace Science, Public Policy, Ageing Research Reviews, Asia Pacific Business Review, European Journal of Operational Research, Current Psychology, and others. Research topics include but are not limited to, labor, education and health economics, international economics and trade, comparative regionalism, the political economy of financial capitalism, neoliberalism, international development and social and economic inequality, civic engagement and civil society development, public sector reform, and economic policy.

Dear reader!

We are thrilled to present to you the second ISE MNU Student Research Review, a yearly research journal published by the International School of Economics at MNU.

Our journal is intended to highlight the best research studies prepared by our graduate and undergraduate students for their final thesis defense. These research works have been chosen and recommended for publication by the review commission after careful examination.

The research presented in this edition covers a wide variety of topics in the field of Economics, Finance, Business Management, Marketing, and IT. This year, we are especially glad to present the first student research study in International Relations, a new and fast-developing area of the ISE research expertise. Most of the papers aim to solve practical problems of the Kazakhstani economy, businesses, and society from a scientific point of view using rigorous research methods. By publishing this journal, we seek to stimulate discussion on those important contemporary issues and contribute to building the ISE MNU research community and, in a wider sense, a research culture in our country.

I hope you will enjoy reading our journal and we encourage you to share it with potentially interested stakeholders!

Dr. Saule Kemelbayeva,

Dean of International School of Economics
MNU

Contents

INFORMATION TECHNOLOGIES

INTERNATIONAL RELATIONS

* Some of the articles included in this list were also presented in a conference digest

Application of Machine Learning for KASE Market Index Movement Predictions

Nursultan Bazarbay

Abstract

Attempts to forecast stock market trends have been made by many researchers coming from different fields using different approaches and techniques. This research aims to investigate the application of machine learning models, specifically Support Vector Machine (SVM) and Long Short-Term Memory (LSTM), for predicting price movements in the Kazakhstan Stock Exchange (KASE) for KASE Index. The study utilizes historical stock price data for KASE Index from the period of 2007-2023 to train and test SVM and LSTM models. The research finds that SVM and LSTM models can produce satisfactory results in predicting the movements of KASE Index. The results suggest that both SVM and LSTM models have the potential to be effective tools for predicting price movements in KASE, and they can be utilized by investors and traders for making informed decisions in their trading strategies. This research contributes to the research on KASE as well as the literature on stock price prediction in the context of KASE by exploring the application of SVM and LSTM models.

Introduction

Today, inflation is one of the most discussed Artificial Intelligence (or AI) is one of the key elements of the Fourth Industrial Revolution (Industry 4.0) that is taking place globally. AI and particularly its component Machine Learning (or ML) has a lot to offer the financial world as finance as a field is rich with well-structured and well maintained, relatively easily accessible and comprehensive data available for use. Thus, it is not surprising that both Machine Learning researchers and finance researchers have shown interest in utilizing this data-rich financial environment and methods of Machine Learning for various purposes including financial risk management, analysis of stock markets, portfolio selection, asset price forecasting etc.

Attempts to forecast stock market trends have been made by many researchers coming from different fields using different approaches and techniques. Technical analysis and fundamental analysis are two classic approaches to forecasting the stock market. The technical analysis utilizes historical time-series data strictly from the stock market itself, the argument being that the stock prices include and reflect all the necessary parameters that affect the stock price, such as the financial environment, a company's activities, etc. Whereas the fundamental analysis is concerned with a specific company's overall performance, which is usually reflected in the financial statement and macroeconomics.

However, in recent years in addition to these classic approaches the interest in harnessing the power of artificial intelligence (AI) and particularly machine learning (ML) has been growing.

Using fundamental analysis approach in ML algorithms for stock price prediction may prove to be a challenging task as the financial statement data usually updates on quarterly or even annual basis and the factors to be considered may vary given different companies, industries, and countries. However, this is not the case for technical analysis.

Thanks to the capacity of ML algorithms to analyze any large datasets, which is usually the case for historical stock prices and other market indicators, and identify pattern and trends to potentially predict the market movement, which is the objective of technical analysis, ML and technical analysis can go hand in hand. Hence the researchers have been studying application and effectiveness of various ML algorithms to the task of "seeing" the future of the market.

However, the current research heavily focuses on large stock markets. There is little research that considers smaller emerging stock markets not to mention frontier markets and there is no research that predicts the movement of stock prices listed on KASE or Indexes related to it using machine learning models. Given the 30-year anniversary of KASE it seems most appropriate for this research to fill the gap. This study will focus on building machine learning models using SVM and LSTM algorithms to forecast the movement of KASE Index based on historical time-series data and technical analysis.

The rest of this thesis is arranged as follows. The second section presents a review of the current literature regarding application of ML algorithms in finance in general and stock market forecasting

specifically. The third section discusses KASE, the KASE Index and dataset as well as the theoretical framework of technical analysis and technical indicators. It also goes over SVM and LSTM algorithms to be implemented in the models and performance metrics for evaluation of results. The fourth section provides the discussion of modeling results and simulation of the best performing models in trading followed by concluding remarks.

Literature Review

Aziz et al. (2021), in their recent review of research on the application of ML in finance, published in the period from 1990 to 2018, mapped the literature on ML in finance using a topic modeling approach and identified three general categories of research:

1) Application of ML for Risk Management in Finance

2) Application of ML for Investment Analysis

3) Application of ML for Asset Modeling & Forecasting

The latter topic, according to Aziz et al. (2021), covers such sub-topics as forex forecasting, volatility modeling, portfolio optimization, energy forecasting, chaos and financial forecasting, as well as techniques for financial forecasting. The research topic of this thesis belongs to the third category, and specifically to stock market forecasting as part of techniques for financial forecasting. Survey by Rundo et al. (2019) reviewed the application of ML to analyzing time-series data and its advantages compared to conventional approaches, such as AR, and showed that ML-based algorithms outperform them when it comes to accuracy. Although this survey is quite recent, researchers have started studying the application of ML algorithms for the stock market prediction task long before it. Huang W. et al. (2005) used technical analysis for predicting the weekly movement direction of the Japanese Stock Market NIKKEI 225 Index with support vector machine (SVM) models. Moody and Saffell (2001) used the technical analysis approach but with a recurrent reinforcement learning algorithm allowing to successfully predict the monthly movement of S&P 500 index as well as intradaily U.S. Dollar / British Pound exchange rates in back tests. In 2015 Patel et al. released two papers that research

the topic of predicting stock index movement using Trend Deterministic Data Preparation for technical indicators and machine learning techniques (2015, January) as well as using fusion of various machine learning techniques including Support Vector Regression (SVR), Artificial Neural Network (ANN), Random Forest (RF) and SVR (2015, March) for two Indian indices - CNX Nifty and S&P Bombay Stock Exchange (BSE) Sensex. Jiao & Jakubowicz (2017) reviewed the effectiveness of four ML classification algorithms: Logistic Regression, Gradient Boosted Trees, Random Forest, and Artificial Neural Network (ANN) in predicting 463 stocks of the S&P 500 and found that recent information for closed European and Asian indexes can significantly improve the predictability for S&P 500. More recently, Chen et al. (2019) built a hybrid EMD-LSTM (empirical mode decomposition - long short-term memory) model for financial time series prediction based on technical analysis. Another recent example also used LSTM to predict large-scale financial market movements by effectively finding meaningful relationships from noisy financial time series data (Fischer T., Krauss C., 2018). In 2021 Rather M.A. proposed a new method for stock price prediction using a regression scheme implemented a long-short-term-memory-based (LSTM) deep neural network for National stock exchange of India and NIFTY-50 Index. He further used this method to build a portfolio optimization model that outperformed several conventional predictive models (Rather, 2021). However not only the variety of ML algorithms applied in these studies is growing but their geography of studies is expanding as well and more researchers are turning their focus to emerging stock markets. As such Saetia & Yokrattanasak (2022) used ML algorithms to analyze technical indicators and Google Trends for the Thai stock market with an aim to develop portfolio selection models. As the stock markets are driven not only by pure numbers but also by human behavior that quite often is led by emotions, the market sentiment becomes another useful factor for predicting the stock market dynamics. One of the first successful attempts to find the connection between the public opinion and the stock market changes was performed by Bollen et al (2011) where they found that Twitter posts can be

helpful in predicting the closing values of Dow Jones Industrial Index (DJIA). The success of Bollen et al. inspired researchers to integrate the market sentiment analysis into the conventional analysis to improve the market stock forecast (Li X. et al, 2011) and more recently to use it as an additional source for multi-source multiple instance learning models (Li J. et al., 2017).

In regard to the additional sources of data to enhance the predictive capacity of the ML model, it is important to mention the application of images, i.e. stock charts, which was shown to be successful in outperforming single-source models (Kim T., Kim H.Y., 2019). The recent review by Jiang W. (2019) of the application of machine learning and deep learning models to stock prediction and forecasting showed that this area of research is still dynamically developing with a trend of using multiple sources and types of data.

As we can see this area of research is growing in many aspects including the variety of algorithms used, geography of stock markets analyzed, types of data utilized. However, the existing research still heavily focuses on large stock markets, e.g., US based NYSE, NASDAQ, Chinese Shanghai SE, or HKEX. And although this is changing there is still little research that considers smaller emerging stock markets where the data volume can affect forecast outcomes, not to mention frontier markets to which KASE belongs.

Moreover, the current literature related to KASE in general appears to be scarce. The existing research of KASE is mostly focused on the analysis of relationships between various macroeconomic indicators and the stock market and its index (Oskenbayev et. al, 2011) (Syzdykova, 2018) (Gnahe, 2020) or impact of oil price changes on the stock market (Yalcin, 2015) (Syzdykova, 2018). The exception to this would be an article by Kerimbek et al. (2019) outlining the history of KASE since 1993 and its development prospects.

However, the research that is dedicated to the application of any machine learning models in the context of KASE or using technical analysis for forecasting purposes of KASE listed stock or its Index is practically non-existent.

This research aims to fill the gap and will focus on building models utilizing machine learning algorithms to predict the movement of KASE Index based on historical time-series data and a set of technical indicators.

Dataset and Methodology

This section describes the dataset and the methodology used in the research. First it reviews Kazakhstan Stock Exchange (KASE), KASE Index and its behavior for the period from October, 2007 till March, 2023. Further it provides the description of the technical indicators built on the Index data and used as inputs for modelling. Following that the information on the models – SVM and LSTM - their application in different fields and appropriateness for the purpose of the study – is provided. Performance metrics to be used for evaluating the modeling results are described further.

Kazakhstan Stock Exchange & KASE Index

For any prediction model to work as intended it is necessary to prepare a valid data set related to the specific phenomenon. In this paper I used stock market time-series data of KASE Index and technical indicators based on it. The data has been collected from official website of KASE (KASE Index - Kazakhstan Stock Exchange (KASE), 2023).

Before analyzing the data and Index it is important to understand KASE as a stock market and be aware of its characteristics. Established in 1993 in Almaty KASE is the main securities exchange in Kazakhstan for trading stocks, bonds, derivatives as well as other financial instruments. KASE is organized as a joint-stock company with a diverse ownership structure (57 shareholders) including several large financial institutions, including banks, insurance companies, and investment firms (94.52% of voting shares), as well as individual investors (5.48% of voting shares). KASE uses an order-driven trading mechanism, where buyers and sellers submit orders to the exchange's trading system, which matches the orders based on price and time priority. In terms of market capitalization KASE is considered a mid-cap stock exchange due to the relatively small number of large, well-established companies listed on it, compared to some of the larger exchanges. As for the trading volume again, compared to the world's larger exchanges it is relatively small, however it has experienced growth in recent years and has been expanding its trading activity through partnerships with other exchanges.
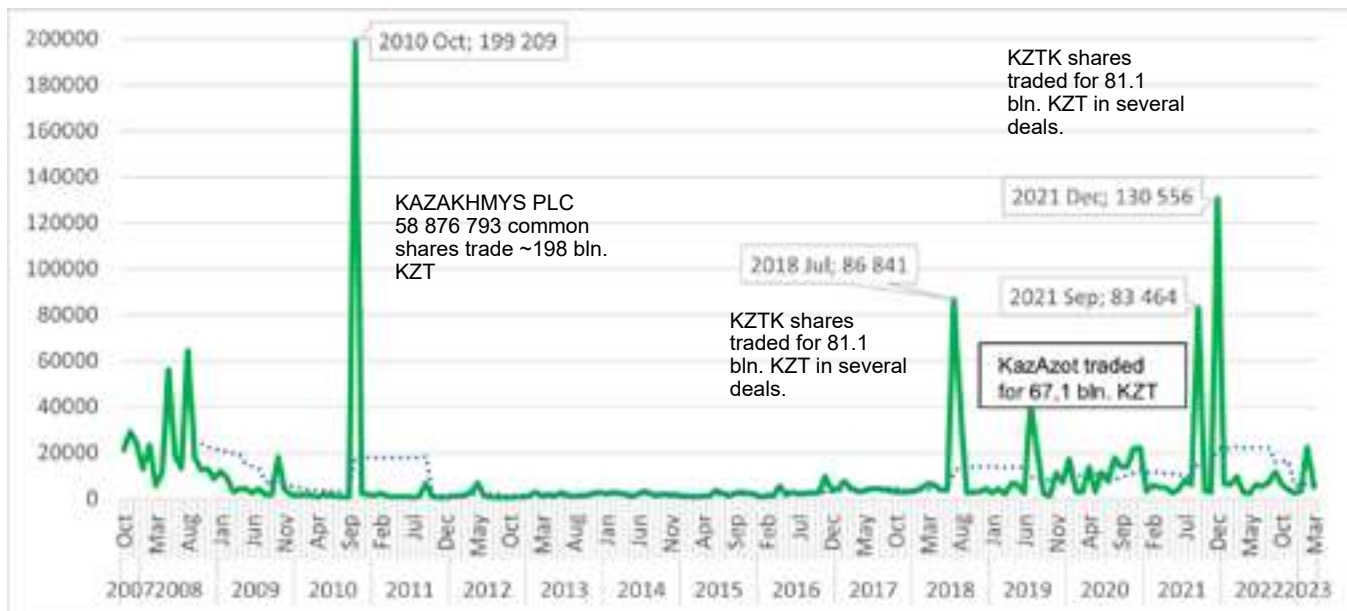
Figure 1. KASE monthly trading volume in millions of KZT

	Code	Company	Weight	Shares, placed	Industry
1	KCEL	Kcell	15,6	199 999 975	Telecom
2	HSBK	Halyk Bank	15,4	10 908 249 222	Finance
3	KSPI	Kaspi.kz	15,4	191 176 929	Finance
4	KMGZ	NC KazMunaiGas	14,6	610 119 493	Energy
5	KZAP	NAC Kazatomprom	14,1	259 356 608	Mining
6	KZTK	Kazakhtelecom	7,6	10 338 514	Telecom
7	CCBN	Center Credit Bank	7,4	188 029 035	Finance
8	KEGC	KEGOC	6,4	259 998 191	Utilities
9	KZTO	KazTransOil	3,4	384 618 364	Energy

Table 1. Composition of KASE Index
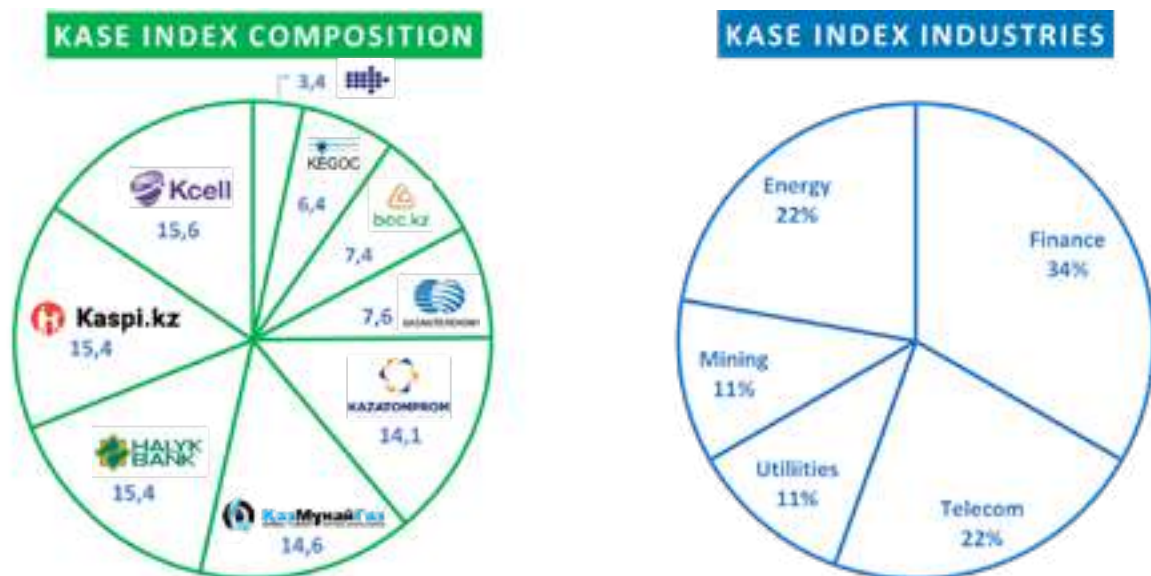
Figure 2. Composition of KASE Index

KASE Index is a share market index reflecting the change in the total market value of the most liquid shares of the official list of KASE Exchange. It is a capitalization-weighted index, which means that the weight of each component stock is determined by its market capitalization. The index includes the largest and most liquid companies listed on KASE, representing a range of industries such as oil and gas, mining, telecommunications, and finance. The Index is calculated as follows:

KASE Index = MCn / Dn

Where:

IndexKASE – KASE index in points;

MC_n – *total market value of shares included in the representative list of the KASE Index, at the time of calculation of n, calculated in accWordance with paragraph 11 of the KASE Index Methodology, in tenge.*

D_n – *the value of the total market value of all shares of the representative list of the KASE index on the first day of calculation of the KASE Index, adjusted taking into account the changes in the representative list of the KASE Index and the initial value of the KASE Index.*

(KASE Index - Kazakhstan Stock Exchange (KASE), 2023)

Currently the Index includes the shares issued by the largest and financially stable resident companies of the Republic of Kazakhstan which are the following 9 companies (KASE Index - Kazakhstan Stock Exchange (KASE), 2023).

Dataset

For the purpose of this research, a dataset for KASE Index daily prices (Open, Close, High, and Low) and trading volumes for the whole period of existence of the Index since inception in October 2007 till March 2023 (15 years) was used.

The Index started on October 1, 2007, at the value of 2560,72 (Close). It dramatically dropped in 2008 due to the global financial crisis and due to the fact, that at the time the representative list of KASE Index included 5 banks who faced the most challenging consequences of the crisis. The effects of the 2011 European debt crisis and US Federal Debt crisis can also be seen on the chart as KASE Index went down from 2000 to 1000 in that year. Since 2015 the Index is on trending upwards in alignment with global financial markets represented here by S&P 500 Index.

Figure 3. KASE Index daily close values, October 2007 – March 2023
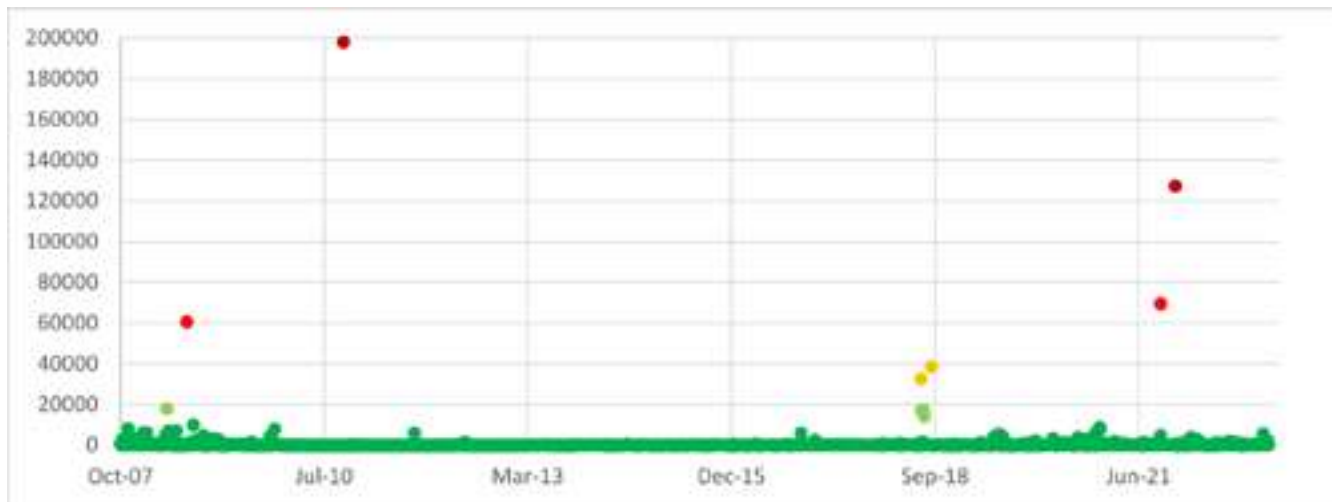
Figure 4. KASE Index daily trading volume, mln. KZT
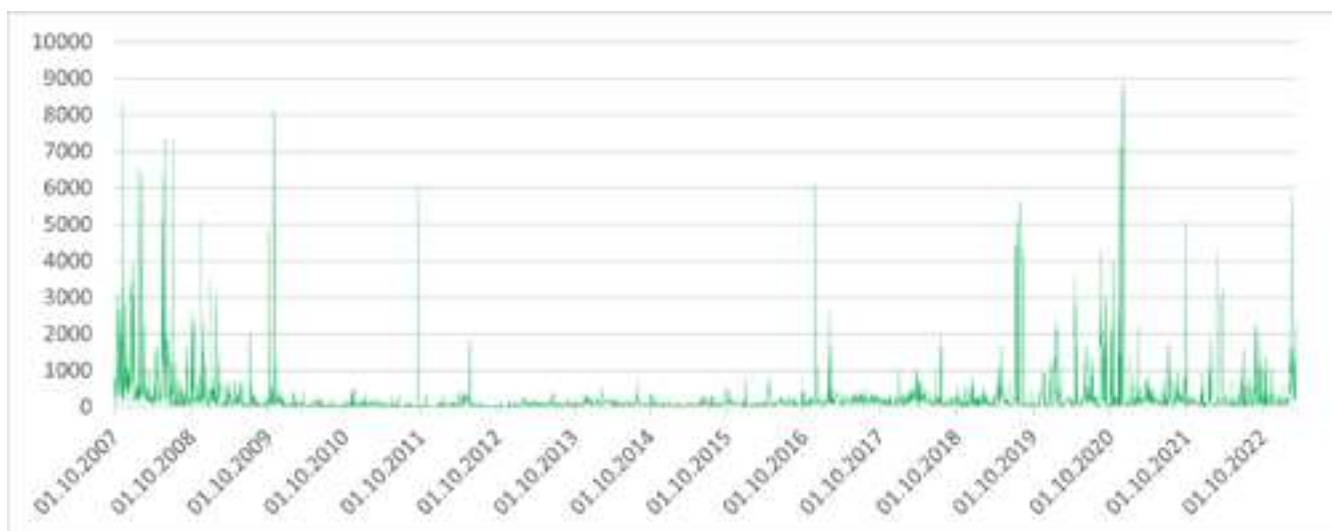
Figure 5. KASE Index daily trading volume - outliers removed, mln. KZT

№	Date	Volume, KZT m	Open	High	Low	Close
1	01.10.2007	32,07	2550,32	2571,26	2525,93	2560,72
2	02.10.2007	705,08	2540,33	2694,51	2518,86	2681,17
3	03.10.2007	306,81	2685,97	2691,65	2612,81	2612,81
...	...	...	...	...	...	...
3799	07.03.2023	2353,21	3322,11	3328,51	3301,96	3311,38
3800	09.03.2023	479,80	3316,88	3316,88	3291,42	3291,42
3801	10.03.2023	149,25	3291,40	3319,19	3282,83	3298,53

Table 3. Original dataset for KASE Index

When examining daily trading volume data, we can see that the absolute majority of data points lie below the volume of 10 billion KZT. However, there are several extreme outliers caused by one-time non-regular events such as changes in the ownership of the companies (Kazakhmys PLC, KCell JSC) or share buy backs (Halyk Bank JSC). Simple exploratory statistical analysis of the trading volume data renders the following results:

Table 2. Basic statistical measure of the dataset

Measure	Value
Number of data points	3801
Maximum (mln. KZT)	198 075
Minimum (mln. KZT)	0
Mean (mln. KZT)	420,89
Median (mln. KZT)	95,72
Mode (mln. KZT)	52,51
Below 10 bln	3790 (99,71%)
Below 5 bln	3771 (99,21%)

By removing outliers from this dataset, we can observe that more accurate picture where trading with KASE Index shares was relatively active before 2008 as the global economy was booming, collapsed with the global financial crisis and recovered only 10 years after. The above-described dataset was used as the input data for the models together with technical indicators built based on them (see example in Table 3).

Technical Analysis and Indicators

According to John J. Murphy, one of the key figures in the field of technical analysis, technical analysis is the study of market action for the purpose of forecasting future market movements (Murphy, 1999). Market action here, also referred to as price action by technicians, consists of price and trading volume data for a specific stock, an Index or derivative traded on the market. The theory that allows for technical analysis to work is that the price of an asset already reflects all available information regarding the asset, including fundamental factors such as economic data, news events, and company financials, and therefore price action can be used to predict market movements. Here it is important to point out that technicians do not accept Efficient Market Hypothesis (EMH) even in the weak form (also known as random walk theory) which states that past prices, trading volume, and earnings data do not affect an asset's price and it moves randomly. For the users of technical analysis, the markets have weak non-efficient form. Whether EMH is true or not is a subject of long-lasting debate since its introduction by Fama in 1970. Since then, several recognized empirical studies have shown that financial markets can be predicted to certain degrees especially given differing psychology and behavioral patterns of market participants (Abu-Mostafa & Atiya, 1996), (Naseer and Tariq, 2015), (Zhong and Enke, 2017).

Having established that technical analysis is capable of providing a desired outcome i.e. predicting price movements, it is necessary to go over the tools it uses to do exactly that. In the context of this research the main tools of technical analysis to be used for machine learning modelling are technical indicators built on the price and volume data and applied by traders and investors to identify trends and patterns in financial markets. Technical indicators use mathematical calculations to plot lines, curves, or other visual representations of market data, and are typically displayed alongside price charts. These visual representations of course are useful for humans to identify patterns and trends in the market visually and in fact it is how the technical analysis started in the early 20th century. (Murphy, 1998) However, the machine learning model have no use for visual plots of these indicators and rather needs the technical indicator values as input.

There is a plethora of different technical indicators used in the technical analysis, however for the purpose of this research a set of common trend-following, momentum and trend-strength indicators was used. The indicators potentially may produce good predictions without creating issues with multicollinearity. The latter issue might arise since when constructing these indicators, the same price and volume data are used as inputs (Fliess & Join, 2009). Therefore, when it comes to using technical indicators for modelling the more the better is not the case. The indicators used are described below.

Moving averages (herein after MA) are averages

of past prices that help smooth out short-term and sometimes random fluctuations and identify longer-term trends. Simple MAs for 5 and 20 days were used since five trading days constitute a week and twenty trading days constitute a month. (Murphy, 1998)

Moving Average Convergence Divergence (herein after - MACD) is a trend-following indicator that shows the relationship between two moving averages of prices. The MACD indicator is calculated by 26 and 12 day exponentially weighted moving averages (EMA), specifically subtracting 12-day EMA from 26-day EMA. In practice MACD is plotted on the price chart together with the signal line (9-day EMA) and whenever they cross traders interpret a bullish or a bearish signal depending on how the MACD line crossed the signal line from below to above (upward trend) or from above to below (downward trend). (Murphy, 1998)

Relative Strength Index (herein after - RSI) is a momentum indicator developed by J. Wells Wilder Jr. in 1978 that measures the magnitude of recent price changes (or strength of price movement) to determine overbought or oversold conditions. It oscillates between 0 and 100 and is calculated using the average gains and losses over a given period of time by the following formula:

RSI = 100 - [100 / (1 + RS)]

Where:

RS (relative strength) = average gain during the up period for the specified period / average loss during the down period for the specified period.

RSI is usually calculated on a 14-period time frame, but this time frame can be customized to suit different needs. An RSI value above 70 is typically considered overbought, while a value below 30 is considered oversold. (Murphy, 1998)

Similar to RSI **Williams %R** is also a momentum indicator that measures the level of a security's closing price relative to its high-low range over a given time period. It oscillates between -100 and 0, with values below -80 considered oversold and values above -20 considered overbought (Murphy, 1998). Like the RSI, traders may use Williams %R to identify potential trend reversals and confirm the strength of existing trends, however Williams %R is more sensitive to short-term price movements than RSI. This means that Williams %R can generate signals more quickly, but can also produce more false signals. On the other hand, RSI is less sensitive to short-term price movements, which means that it can take longer to generate signals, but may be more reliable. Given this difference in sensitivity both indicators have been used as inputs for the models. (Fliess & Join, 2009)

Parabolic Stop and Reverse (herein after - SAR) is a trend-following indicator that is used to determine the direction of the trend and timing to enter and exit positions in a market. It plots points above or below price to signal when a trend is reversing and can be used to set stop-loss orders or identify potential entry or exit points. The formula for parabolic SAR is based on acceleration factor (AF) and extreme points (EP) and uses current price and the indicator's previous values (Murphy, 1998):

$PSAR(n) = PSAR(n-1) + AF \times (EP - PSAR(n-1))$

Where:

• PSAR(n) is the PSAR value for the current period;

• PSAR(n-1) is the PSAR value for the previous period;

• AF is the acceleration factor (starts at 0.02, increases by 0.02 with new EP, maximum value 0.20);

• EP is the extreme point for the current trend.

SAR is represented by a series of dots on a price chart positioned below or above the price that signal possible reversals in the trend. Dots above price signal a downtrend whereas dots below the price indicate an uptrend. It is often used in conjunction with other technical indicators, such as RSI and Williams %R, to confirm signals and help traders make more informed decisions (Fliess & Join, 2009).

The Average Directional Index (herein after ADX) is a technical indicator that measures the strength of a security's trend regardless of its direction developed by J. Welles Wilder in 1978 in the framework of his technical analysis system called the Directional Movement System. ADX is non-directional indicator as it indicates only the strength of the trend but not its direction. It ranges from 0 to 100, with values above 25 typically indicating a strong trend. The ADX is calculated using the difference between the +DI (positive directional indicator) and -DI (negative directional indicator), which are based on the security's price movements. Traders may use the ADX to help identify the strength of a trend and to make decisions about

entering or exiting positions. ADX is often used in combination with moving averages or oscillators since it cannot indicate the direction of the price movement (Fliess & Join, 2009). Using the original dataset for KASE Index containing price action data and Technical Analysis library for Python programming language the final dataset to be fed to the models was created. The final dataset had a total of 3782 samples.

Date	Volume, KZT m	Close	ma5	ma20	26ema	12ema	MACD	RSI	Williams %R	SAR	ADX
29.10.2007	1903	2613	2568	2567	2576	2582	6,14	53,79	-40,73	2532	10,14
30.10.2007	1348	2617	2583	2570	2579	2587	7,88	54,03	-38,41	2532	9,61
31.10.2007	1501	2641	2598	2568	2585	2596	10,76	55,87	-9,71	2555	9,35
01.11.2007	1845	2590	2609	2567	2585	2595	9,43	51,26	-68,07	2574	10,63
02.11.2007	436	2556	2603	2574	2583	2589	5,94	48,35	-75,99	2714	9,67
07.03.2023	2353	3311	3318	3345	3328	3330	1,53	44,08	-74,46	3340	24,78
09.03.2023	480	3291	3310	3341	3325	3324	-1,63	38,37	-82,89	3329	23,99
10.03.2023	149	3299	3307	3339	3323	3320	-3,52	41,29	-69,12	3329	23,88

Table 4. The final dataset with technical indicators used for modelling.

Models

In this study two models using Support Vector Machine (herein after – SVM) and Long short-term memory (herein after - LSTM) machine learning algorithms were built to predict the directional movement of KASE Index.

Support Vector Machine

Support Vector Machine (SVM) is a supervised machine learning algorithm used to solve regression, classification, and outlier detection problems. It was first introduced to the world by Corinna Cortes and Vladimir Vapnik in 1995 in their work titled "Support-Vector Networks," where they described a novel way to implement linear classifiers using the theory of statistical learning. (Cortes & Vapnik, 1995). Since then, SVM has only grown more popular and been used as a tool for a wide array of applications such as image classification and object recognition (Thai et al., 2012), natural language processing and sentiment analysis (Rezwanul et al., 2017), bioinformatics and medical diagnosis (Lin et al., 2008), financial prediction (Lin et al., 2013) (Strader et al., 2020) and more (Cervantes et al., 2020).

At its core SVM is an extension of the maximal margin classifier, a straightforward and intuitive classifier. However, the maximal margin classifier is limited in its applicability, as it only works with data sets where classes can be separated by a linear boundary. Hence the support vector classifier and further SVM were developed as an expansion of the maximal margin classifier, allowing for a wider range of applications. Moreover, the latter was designed to be able to handle non-linear class boundaries (James et al., 2017).

SVM works by finding the best possible decision boundary (or hyperplane) that can separate different classes in a given dataset. In case of binary classification problems, where the objective is to classify data into one of two possible classes, SVM aims to find a hyperplane that maximizes the margin between the two classes where the margin is the distance between the hyperplane and the closest data points from each class thus separating the two classes, as shown in the following figure:
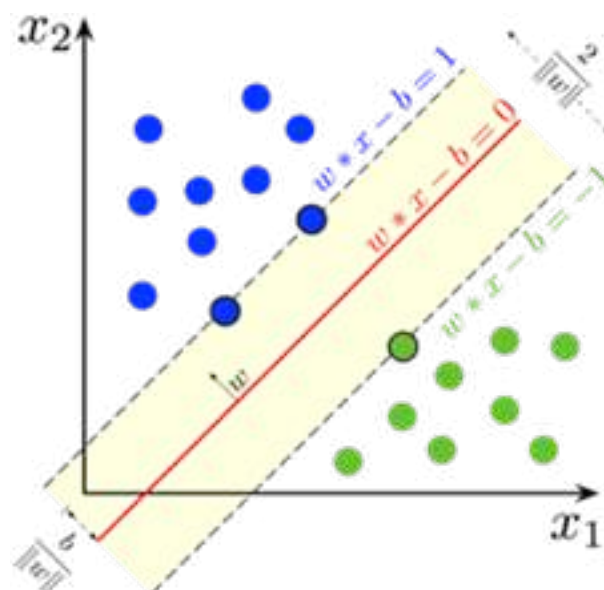

Figure 6. Maximum-margin hyperplane and margins for an SVM

In figure 6, the red line represents the hyperplane that separates the two classes. The two closest data points (one from each class) that lie on the margin are called support vectors. These support vectors essentially determine the hyperplane, since their position and orientation affect the margin.

In the case of a linearly separable dataset, as mentioned above SVM finds the hyperplane that maximizes the margin between the two classes. The hyperplane is defined by the equation:

$$w * x + b = 0$$

where w is the weight vector perpendicular to the hyperplane, x is the feature vector of a data point, and b is the bias term (Hastie et al., 2017).

In cases when the dataset cannot be separated linearly, SVM uses a kernel function i.e. a function that maps the original data into a higher-dimensional feature space by computing the dot product of the transformed feature vectors in the higher-dimensional space without actually computing the transformation explicitly where the classes may be linearly separable. This allows SVM models to handle complex datasets as it is computationally quite efficient. SMV employs several kernel functions including as linear, polynomial, radial basis function (RBF), and sigmoid. The choice of kernel depends on the nature of the dataset and the problem at hand (Scholkopf & Smola, 2018).

As mentioned previously SVM has been used for financial forecasting and specifically to classify the movement of stock prices in the stock market. In these cases, the SVM model is fed a set of features that are indicative of stock price movements and a corresponding set of labels that indicate whether the stock price went up or down. Then the model learns to classify future price movements based on the patterns it observes in the training data.

Since the features to be used as input to SVM can vary depending on the problem at hand, it is worth outlining some common features applicable for stock price movement forecasting using machine learning models. These commonly used features include the technical indicators described above as well as news sentiment and economic indicators (Strader et al., 2020). Using the news sentiment implies application of sentiment analysis to determine the tone and sentiment of news articles and social media posts about a particular stock or market index. Positive or negative sentiment can affect investor sentiment and behavior, which in turn can move stock prices.

As for the economic indicators such as inflation rates, interest rates, and GDP growth rates, they might prove useful for modeling as providers of insights into the overall health of the economy and the potential direction of the stock market.

Once the features have been identified, they are normalized i.e., preprocessed to rescale the input into similar ranges, and then fed into the SVM algorithm. Further, as previously described the SVM algorithm finds the hyperplane that separates the two classes (i.e., stock price went up or down) with the largest margin. After the training, the SVM algorithm takes in a new set of features and uses the learned weights and biases to predict the movement of the stock price – up or down.

Long short-term memory - LSTM

LSTM represents an artificial recurrent neural network (RNN) architecture widely used in Deep learning and Artificial intelligence. It was developed by Sepp Hochreiter and Jurgen Schmidhuber in the 1990-s as an RNN method that can successfully deal with vanishing or exploding gradients which quite often affected the effectiveness of other RNN models (Hochreiter & Schmidhuber, 1997). It is worth discussing here how basic RNN algorithms work in order to understand the advantages of LSTM.

RNNs are a type of neural networks which in turn are machine learning algorithms that imitate the structure and function of the human brain. Neural networks are built with interconnected nodes – neurons - working in unison to process and analyze data. NNs are usually organized in layers where the first layer receives the input data, and each further layer performs different operations with this data to arrive at a desired outcome. One of the specialties of recurring neural networks is their effectiveness in working with time-series data thanks to their ability to learn and remember long-term dependencies in the data sequence and use them to produce output. These dependencies are learnt during the training through the process of backpropagation by computing the loss function and the gradient (i.e. rate of change) of the loss. One of the biggest challenges of RNNs are vanishing/exploding gradient problems, where the gradients become too small/big thus making it difficult for the model to learn the long-term dependencies. (Goodfellow et al., 2016)

LSTM overcomes this problem by introducing a special memory cell that can store and retrieve

information over long periods of time. The cell is controlled by three gates – the input gate, the output gate, and the forget gate – that regulate the flow of information in and out of the cell. The input gate determines how much new information is added to the cell from a layer of the network, the output gate controls how much information is output from the cell, and the forget gate decides how much information should be discarded from the cell. (Greff, K., et al, 2016)

Given the above-described features of the LSTM algorithm it has proven its effectiveness dealing with sequential data is such areas as natural language processing (Melamud et al., 2016), image and video processing (Donahue et al., 2017), healthcare (Wang et al., 2018), robotics (Park et al., 2018), and time-series analysis (Gamboa, 2017). LSTM models have also been applied successfully in finance for stock market prediction (Vargas et al., 2017), anomaly detection (Ergen & Kozat, 2020) and risk management (Wang et al., 2019).

As for the modeling process itself, much like for SVM, it starts with identifying unput features which could be original market stock data, technical indicators, economic indicators, news sentiment or all combined. Since LSTM is a neural network, its architecture will be different from SVM and will consist of an input layer that takes in the features, one or more LSTM layers that are designed to help the model capture and learn patterns in the data, and an output layer that produces an output – up or down – when framed as binary classification problem (Greff, K., et al, 2016).

Performance metrics

After collecting and processing data, building and running models the next step is to evaluate the models i.e. how correctly models can predict the movement of a stock price or index. The problem at hand being a binary classification problem the most common and appropriate methods to evaluate the performance of such models are accuracy, precision, recall, F1 score and ROC AUC score (Guido & Müller, 2016).

These metrics can be derived from a confusion matrix which shows the number of true positives (TP) - correctly classified positive outcomes, false positives (FP) – incorrectly predicted positive outcomes, true negatives (TN) – correctly predicted negative outcomes, and false negatives (FN) - incorrectly predicted negatives outcomes. These are the four possible outcomes of a binary classification problem (Guido & Müller, 2016).

Figure 7. Confusion matrix

Using the confusion matrix data one can measure the accuracy of the model which is a measure of the model's overall performance. It is defined as the number of correct predictions divided by the total number of predictions:

$$Accuracy = \frac{TP}{TP+FP+TN+FN}$$

Accuracy measures the proportion of true positive and true negative predictions made by the model. However, accuracy can be misleading in cases where the dataset is imbalanced, meaning that there are many more instances of one class than another.

In such cases precision and recall would be more appropriate since they measure the model's ability to correctly identify positive instances. Precision is defined as the number of true positive predictions divided by the total number of positive predictions (true positive + false positive):

$$Precision = \frac{TP}{TP+FP}$$

In other words, precision measures the proportion of instances classified as positive by the classifier that are actually positive.

On the other hand, recall, also known as true positive rate or sensitivity, is a measure of the model's ability to correctly identify all positive instances. It is defined as the number of true positive predictions divided by the total number of positive instances in the dataset (true positive + false negative):

$$Recall = \frac{TP}{TP+FN}$$

Recall measures the model's ability to avoid false negatives, which are instances that are predicted as negative but are positive. In other words, it measures the proportion of actual positive instances that the classifier correctly identified as positive. It is clear here that recall and precision have an inverse relationship. That is, as recall increases, precision tends to decrease, and vice versa. This is because a classifier that identifies more positive instances (higher recall) is likely to also identify more false positives, which reduces the precision. For example, consider a binary classifier that is designed to detect fraudulent credit card transactions. A high precision would mean the classifier correctly identifies only the fraudulent transactions and minimizes the number of false alarms, whereas a high recall would mean the classifier can correctly identify a large proportion of the fraudulent transactions in the dataset. If the classifier is tuned to have high recall, it may identify many transactions as fraudulent (including some that are legitimate), resulting in a lower precision. Conversely, if the classifier is tuned to have high precision, it may identify only the transactions that are highly likely to be fraudulent, resulting in a lower recall. The balance between recall and precision depends on the specific application and the desired trade-offs. In some applications, such as detecting fraud or identifying disease, high recall may be more important than high precision to ensure that all cases are detected, even if there are some false positives. In other applications, such as filtering spam or detecting objects in images, high precision may be more important than high recall to minimize false positives and ensure that only relevant instances are identified (Guido & Müller, 2016)

In cases when both recall and precision are important, the F1 score can be a useful metric to evaluate the performance of a classifier, as it takes into account both precision and recall, and provides a balanced view of the classifier's effectiveness, especially when the dataset is imbalanced (Géron, 2019). It is defined as the harmonic mean of precision and recall, which gives equal weight to both metrics:

$$F1score = \frac{2*(precision*recall)}{precision+recall}$$

Another useful metric is ROC AUC Score (Receiver Operating Characteristic Area Under the Curve) which is a performance metric that measures the ability of a binary classifier to distinguish between positive and negative classes. It is a curve that plots the true positive rate (TPR) against the false positive rate (FPR) at various classification thresholds. The area under the ROC curve (AUC) is a measure of the overall performance of the classifier. A classifier with an ROC AUC score of 1 is considered to be perfect, while a score of 0.5 indicates that the classifier is no better than random guessing (Géron, 2019).

Since the end goal of predicting the stock market movement is to gain insight into the market, trade using this new knowledge and make profit, it would be interesting to see the performance of the best models in a trading simulation. The trading simulator would be built in the same environment as the models and would use a data for the period outside of training and testing dataset, preprocess it using the same technical indicators and apply the bult model to generate trading signals. If the model predicts an upward movement and no shares are held, the code would buy shares, and if the model predicts a downward movement and shares are held, the code would sell them. If it is the last day of trading and shares are still held, they are sold, and the final portfolio value is calculated.

Modeling & Results

In the experimental phase of the study two ML models – SVM and LSTM – have been built and sixteen simulations were run using four different sets of technical indicators as features for two time periods – 2013-2022 and 2007-2023.

Based on the similar research for S&P 500 Index (Kamalov et al., 2020) and S&P Bombay Stock Exchange (BSE) Sensex (Patel et al., 2015) as well as considerations related for a trade-off in accuracy for longer period due to the possibility of more noise in the data, initially 10-year period from January 2013 to December 2022 for KASE Index was used for modeling. However, SVM model performed no better than 50/50 chance for some set of technical indicators based on this 10-year period and it's been decided to use the whole period of existence of the KASE Index from October 2007 till March 2023. This decision allowed to improve the performance for SVM. In order to see how different technical indicators would affect the performance

of the models both SVM and LSTM model used four sets of technical indicators:

1. Moving Average
2. MACD
3. Set of RSI, Williams %R, Parabolic SAR and ADX
4. Combined set of MA, MACD, RSI, Williams %R, Parabolic SAR and ADX

The closing values of the KASE Index data was preprocessed to create these features and a target column, where 1 represents an upward movement and 0 represents a downward movement in the next period. The goal of each model was to classify the outcome for the next day as 1 (i.e. Index went up) or 0 (i.e. went down). The data was split into training and testing sets using the ratio of 80/20. (03.01.2013 – 29.12.2020) / (30.12.2020 – 30.12.2022)

The SVM model used the data normalized with StandardScaler and an SVM classifier with linear kernel. The parameters of the LSTM model are described in the table below (Table 5).

Parameter	Description
LSTM layer	Specifies the number of memory cells in the LSTM layer. In this case, there are 50 LSTM neurons.
Input shape	(X_train.shape[1], 1) The first element specifies the number of time steps in the input sequence, and the second element specifies the number of features in each time step.
Dense layer	A single output neuron with a sigmoid activation function, which predicts the probability of an upward price movement.
Loss function	Binary cross-entropy, commonly used for binary classification problems.
Optimizer	Adam, an adaptive learning rate optimization algorithm.

Table 5. Parameters of the LSTM model

After training the models were run to make predictions on the testing data. Further, the predictions were compared to the actual labels to calculate evaluation metrics, including accuracy, precision, recall, f1 score, confusion matrix, and area under the ROC curve (AUC). Here upward movement of the Index is classified as 1 and assigned as the positive, while downward movement is classified as 0 and assigned as the negative.

In case of the first period (2013-2022) the LSTM model's accuracy was highest when the set of technical indicators including everything MAs 5 & 20, MACD, RSI, Williamson%, SAR & AXD amounting to 0.5728. Although the set of indicators with only RSI, Williamson%, SAR & AXD is not too far behind it with 0.5708. The precision scores range from 0.5563 for MACD to 0.6048 for the set of RSI, Williamson%, SAR & AXD. However, the range for recall scores not only wider but they are inversed with the lowest of 0.6431 for the set of RSI, Williamson%, SAR & AXD to the highest for 0.9293 MA. This indicates that the LSTM for this timeframe has the same issue as SVM, although in a weaker form, and tends to predict upward movement in the market, as the number of false positives is higher than the number of false negatives for the sets of indicators containing MAs. The confusion matrix confirms this with a high number of true and false positives for this set of technical indicators.

The F1-scores, which are the harmonic mean of precision and recall, range from 0.6234 to 0.7022, indicating that the model has a moderate level of performance. However, due to the issue with the upward bias prediction caused by MA indicators, the F1-score becomes invalid. Finally, the only acceptable AUC score of 0.5623 belongs to the RSI, Williamson%, SAR & AXD set of technical indicators, for other sets the model's ability to predict the movement of the Index is just slightly better than random guessing.

Overall, much like for SVM the RSI, Williamson%, SAR & AXD set provides the best results for LSTM model given a 10 year period between 2013 and 2022.

LSTM Model				
Indicators ⟍ Metric	MA 5 & 20	MACD	RSI, Williamson%, SAR & AXD	All
January 2013 – December 2022				
Accuracy	0.5646	0.5437	0.5708	0.5728
Precision	0.5643	0.5563	0.6048	0.5776
Recall	0.9293	0.87132	0.6431	0.8438
F1	0.7022	0.6790	0.6234	0.6858
Confusion matrix	tp-fp [250 193] fn-tn [19 25]	[237 189] [35 30]	[173 113] [96 105]	[227 166] [42 52]
AUC	0.5220	0.5041	0.5623	0.5411

Table 8. Performance metrics for LSTM model given different sets of input data, 2013-2022

LSTM Model				
Indicators ⟍ Metric	MA 5 & 20	MACD	RSI, Williamson%, SAR & AXD	All
October 2007 – March 2023				
Accuracy	0.5614	0.5624	0.5521	0.5574
Precision	0.5617	0.5901	0.6020	0.5750
Recall	0.9451	0.6840	0.5632	0.7684
F1	0.7046	0.6336	0.5819	0.6578
Confusion matrix	[396 309] [23 29]	[288 200] [133 140]	[236 156] [183 182]	[322 238] [97 100]
AUC	0.5154	0.5479	0.5508	0.5321

Table 9. Performance metrics for LSTM model given different sets of input data

When the data timeframe has been expanded from October 2007 to March 2023 again the performance for all sets of indicators that included moving averages improved. Much like for SVM the performance of the LSTM model with the MACD as input features yielded better overall results.

Based on these simulations it seems that the RSI, Williamson%, SAR & AXD has the potential to produce more robust results for different timeframe and cycles in the market and across different performance metrics compared to other technical indicators containing moving averages. However, MACD may improve the performance of the models if the market data contains examples of both downtrend and uptrend for the models to learn as it did in the simulations of this research.

As for the comparison between SVM and LSTM performance it is necessary first to identify metrics that would be most appropriate for the given dataset. The dataset is relatively balanced between "Price rise" classes with upward movement (1) being 53% and downward movement (0) of 47%. Moreover, the costs of false positives and false negatives are not significantly different. And although precision and recall helped in identifying the flaws of the models when using the 10-year period, there is no need to use such metrics for comparison between the and LSTM models. Therefore, accuracy can serve as a good measure of performance. SVM Additionally, the ability of the AUC score to indicate the performance of the model compared to a 50/50 random

might also be useful for comparison reasons. As can be seen in Tables 10 & 11 given the same set of indicators and timeframe with very similar AUC scores SVM models outperform LSTM models in accuracy albeit slightly.

Metric	SVM	LSTM
Accuracy	0.5996	0.5708
AUC	0.5662	0.5623

Table 10. Comparison of SVM and LSTM using RSI, Williamson%, SAR & AXD for 2013-2022

Metric	SVM	LSTM
Accuracy	0.5808	0.5624
AUC	0.5428	0.5479

Table 11. Comparison of SVM and LSTM using MACD for 2007-2022

Having identified the best performing models for both SVM and LSTM with specific sets of indicators, the next step was to place the model in a setting that is closer to real-life application i.e. run a trading simulation for a new data. In this case the trading simulation was run using the KASE Index values for 19 trading from March 10 to April 10 of 2023 which is outside of the dataset used for training and testing the models. The simulator was given 10000 US dollars and traded in accordance with the rules describe in the methodology section. Interestingly, both SVM models despite being trained using different sets of technical indicators and timeframes and difference in accuracy produced the same return.

Metric	SVM Value
Initial portfolio value	$10000.00
Final portfolio value	$10455.14
Trading period (days)	19
Trading period return	4.55%
Annualized return	80.46%

Table 12. Performance of both SVM models in the trading simulation

The LSTM models, on the other hand, differed in their trading performance. Here in Table 13 LSTM 1 is the LSTM model that was trained using the RSI, Williamson%, SAR & AXD set and timeframe of 2013-2022, whereas LSTM 2 is the model that used MACD and the 2007-2023 timeframe.

Metric	LSTM 1	LSTM 2
Initial portfolio value	$10000.00	$10000.00
Final portfolio value	$10205.67	$10387.79
Trading period (days)	19	19
Trading period return	2.06%	3.88%
Annualized return	31.00%	65.63%

Table 13. Performance of LSTM models in the trading simulation

The trading simulator has further proven the findings of the accuracy evaluation of the models i.e. the SVM models in this context outperform the LSTM models. Moreover, the positive returns provided by the application of the models indicate their potential usefulness for traders. However, it is necessary to point out that much like technical analysis itself these models, when used in real life trading or investing should be used in combination with other tools available.

Conclusion

This study sought to explore the application and effectiveness of machine learning models, specifically Long Short-Term Memory (LSTM) and Support Vector Machine (SVM), in predicting the movements of KASE Index on the Kazakhstan Stock Exchange (KASE) utilizing the methods of technical analysis. It was built based on the existing literature on the application of machine learning algorithms for stock market forecasting but represents the first of its kind in terms of applying the said algorithms in the context of KASE. To train and test the models, historical data on KASE Index values from 2007 to 2023 as well as the set of technical indicators were utilized.

The study found that both LSTM and SVM models can produce satisfactory outcomes in forecasting the movements of KASE Index with SVM models having a slight edge over LSTM models. As a result, these models could be valuable tools for investors and traders seeking to make informed decisions about their trading strategies on KASE.

While the findings of this study demonstrate the potential effectiveness of Long Short-Term Memory (LSTM) and Support Vector Machine (SVM) models in predicting the movements of KASE Index, there are some limitations to

be considered. One of the main limitations is the relatively small dataset utilized in this study, covering only the period from 2007 to 2023. The study showed that expansion of the timeframe can yield better performance from the models. However, for the KASE Index one would have to wait for new data to accumulate. Therefore, future studies might also consider application of these models to specific stocks listed on KASE which have longer history. Additionally, the study utilized a limited set of technical indicators to train and test the models to avoid issues with multicollinearity, which may have restricted their accuracy. Therefore, incorporating different technical indicators may prove useful. Moreover, it would be interesting to see in future research application of not only different technical indicators but also economic indicators and news sentiment as features to train and test the models and investigate their effect on the accuracy of the predictions.

Given the always developing breakthrough nature of AI and machine learning, future research can investigate the performance of other ML algorithms such as Transformer-XL, Prophet, WaveNet in predicting the movements of KASE Index or stocks listed on KASE.

This research expands the literature on stock price forecasting in the context of KASE by demonstrating that SVM and LSTM models have the potential to enhance investment decision-making by predicting price movements with satisfactory level of accuracy.

As such the findings will hopefully contribute to the research of KASE as a frontier stock market and will ignite the interest in the topic among Kazakhstani researchers.

References:

1) Abu-Mostafa, Y. S., & Atiya, A. F. (1996, July). Introduction to financial forecasting. Applied Intelligence, 6(3), 205–213. https://doi.org/10.1007/bf00126626

2) Aziz, S., Dowling, M., Hammami, H., & Piepenbrink, A. (2021, July). Machine learning in finance: A topic modeling approach. European Financial Management, 28(3), 744–770. https://doi.org/10.1111/eufm.12326

3) Ballings, M., Van den Poel, D., Hespeels, N., & Gryp, R. (2015, November). Evaluating multiple classifiers for stock price direction prediction. Expert Systems With Applications, 42(20), 7046–7056. https://doi.org/10.1016/j.eswa.2015.05.013

4) Bollen, J., Mao, H., & Zeng, X. (2011, March). Twitter mood predicts the stock market. Journal of Computational Science, 2(1), 1–8. https://doi.org/10.1016/j.jocs.2010.12.007

5) Cervantes, J., Garcia-Lamont, F., Rodríguez-Mazahua, L., & Lopez, A. (2020, September). A comprehensive survey on support vector machine classification: Applications, challenges and trends. Neurocomputing, 408, 189–215. https://doi.org/10.1016/j.neucom.2019.10.118

6) Chen, L., Chi, Y., Guan, Y., & Fan, J. (2019, May). A Hybrid Attention-Based EMD-LSTM Model for Financial Time Series Prediction. 2019 2nd International Conference on Artificial Intelligence and Big Data (ICAIBD). https://doi.org/10.1109/icaibd.2019.8837038

7) Donahue, J., Hendricks, L. A., Rohrbach, M., Venugopalan, S., Guadarrama, S., Saenko, K., & Darrell, T. (2017, April 1). Long-Term Recurrent Convolutional Networks for Visual Recognition and Description. IEEE Transactions on Pattern Analysis and Machine Intelligence, 39(4), 677–691. https://doi.org/10.1109/tpami.2016.2599174

8) Dupond, S. (2019). A thorough review on the current advance of neural network structures. Annual Reviews in Control, 14(14), 200-230.

9) Ergen, T., & Kozat, S. S. (2020, August). Unsupervised Anomaly Detection With LSTM Neural Networks. IEEE Transactions on Neural Networks and Learning Systems, 31(8), 3127–3141. https://doi.org/10.1109/tnnls.2019.2935975

10) Fischer, T., & Krauss, C. (2018, October). Deep learning with long short-term memory networks for financial market predictions. European Journal of Operational Research, 270(2), 654–669. https://doi.org/10.1016/j.ejor.2017.11.054

11) Gamboa, J. C. B. (2017). Deep learning for time-series analysis. arXiv preprint https://doi.org/10.48550/arXiv.1701.01887 .

12) Géron, A. (2019, October 22). Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems.

13) Gnahe, F. E. (2021, October 31). Do macroeconomic variables impact stock

market returns? Evidence from Kazakhstan. Global Journal of Business, Economics and Management: Current Issues, 11(3), 254–273. https://doi.org/10.18844/gjbem.v11i3.5620

14) Goodfellow, I., Bengio, Y., & Courville, A. (2016). Deep learning. MIT press.

15) Greff, K., Srivastava, R. K., Koutnik, J., Steunebrink, B. R., & Schmidhuber, J. (2017, October). LSTM: A Search Space Odyssey. IEEE Transactions on Neural Networks and Learning Systems, 28(10), 2222–2232. https://doi.org/10.1109/tnnls.2016.2582924

16) Guido, S., & Müller, A. (2016, November 15). Introduction to Machine Learning with Python: A Guide for Data Scientists.

17) Hastie, T., Tibshirani, R., Friedman, J., & Friedman, J. H. (2017, June 29). The Elements of Statistical Learning: Data Mining, Inference, and Prediction. https://doi.org/10.1007/b9460810.1007/978-0-387-84858-7

18) Hochreiter, S., & Schmidhuber, J. (1997, November 1). Long Short-Term Memory. Neural Computation, 9(8), 1735–1780. https://doi.org/10.1162/neco.1997.9.8.1735

19) Huang, W., Nakamori, Y., & Wang, S. Y. (2005, October). Forecasting stock market movement direction with support vector machine. Computers & Operations Research, 32(10), 2513–2522. https://doi.org/10.1016/j.cor.2004.03.016

20) James, G., Hastie, T., Tibshirani, R., & Witten, D. (2017, June 29). An Introduction to Statistical Learning: With Applications in R (Vol. 103). https://doi.org/10.1007/978-1-4614-7138-7

21) Jiang, W. (2021, December). Applications of deep learning in stock market prediction: Recent progress. Expert Systems With Applications, 184, 115537. https://doi.org/10.1016/j.eswa.2021.115537

22) Jiao, Y., & Jakubowicz, J. (2017, December). Predicting stock movement direction with machine learning: An extensive study on S&P 500 stocks. 2017 IEEE International Conference on Big Data (Big Data). https://doi.org/10.1109/bigdata.2017.8258518

23) Jordan, M. I., & Mitchell, T. M. (2015, July 17). Machine learning: Trends, perspectives, and prospects. Science, 349(6245), 255–260. https://doi.org/10.1126/science.aaa8415

24) Kamalov, F., Smail, L., & Gurrib, I. (2020, December). Forecasting with Deep Learning: S&P 500 index. 2020 13th International Symposium on Computational Intelligence and Design (ISCID). https://doi.org/10.1109/iscid51228.2020.00102

25) KASE Index - Kazakhstan Stock Exchange (KASE). (2023, April 10). KASE Index - Kazakhstan Stock Exchange (KASE). https://kase.kz/en/stock_market/index_kase/

26) Kerimbek, G., Moldashbayeva, L., Jrauova, K., Satymbekova, K., & Imanbayeva, Z. (2019, February 15). History and prospects of development of the stock exchange. Series of social and human sciences, 1(323), 60–65. https://doi.org/10.32014/2019.2224-5294.8

27) Kim, T., & Kim, H. Y. (2019, February 15). Forecasting stock prices with a feature fusion LSTM-CNN model using different representations of the same data. PLOS ONE, 14(2), e0212320. https://doi.org/10.1371/journal.pone.0212320

28) Li, J., Bu, H., & Wu, J. (2017, June). Sentiment-aware stock market prediction: A deep learning method. In 2017 international conference on service systems and service management (pp. 1-6). IEEE.

29) Li, X., Wang, C., Dong, J., Wang, F., Deng, X., & Zhu, S. (2011, August). Improving stock market prediction by integrating both market news and stock prices. In International conference on database and expert systems applications (pp. 279-293). Springer, Berlin, Heidelberg.

30) Lin, Y., Guo, H., & Hu, J. (2013, August). An SVM-based approach for stock market trend prediction. The 2013 International Joint Conference on Neural Networks (IJCNN). https://doi.org/10.1109/ijcnn.2013.6706743

31) Melamud, O., Goldberger, J., & Dagan, I. (2016, August). context2vec: Learning generic context embedding with bidirectional LSTM. In Proceedings of the 20th SIGNLL conference on computational natural language learning (pp. 51-61).

32) Moody, J., & Saffell, M. (2001, July). Learning to trade via direct reinforcement. IEEE Transactions on Neural Networks, 12(4), 875–889. https://doi.org/10.1109/72.935097

33) Naseer, M., & Bin Tariq, D. (2015). The efficient market hypothesis: A critical review of the literature. The IUP Journal of Financial Risk Management, 12(4), 48-63.

34) Oskenbayev, Y., Yilmaz, M., & Chagirov, D. (2011). The impact of

macroeconomic indicators on stock exchange performance in Kazakhstan. African Journal of Business Management, 5(7), 2985.

35) Park, D., Hoshi, Y., & Kemp, C. C. (2018, July). A Multimodal Anomaly Detector for Robot-Assisted Feeding Using an LSTM-Based Variational Autoencoder. IEEE Robotics and Automation Letters, 3(3), 1544–1551. https://doi.org/10.1109/lra.2018.2801475

36) Patel, J., Shah, S., Thakkar, P., & Kotecha, K. (2015, January). Predicting stock and stock price index movement using Trend Deterministic Data Preparation and machine learning techniques. Expert Systems With Applications, 42(1), 259–268. https://doi.org/10.1016/j.eswa.2014.07.040

37) Patel, J., Shah, S., Thakkar, P., & Kotecha, K. (2015, March). Predicting stock market index using fusion of machine learning techniques. Expert Systems With Applications, 42(4), 2162–2172. https://doi.org/10.1016/j.eswa.2014.10.031

38) Rather, A. M. (2021). LSTM-based Deep Learning Model for Stock Prediction and Predictive Optimization Model. EURO Journal on Decision Processes, 9, 100001. https://doi.org/10.1016/j.ejdp.2021.100001

39) Rezwanul, M., Ali, A., & Rahman, A. (2017). Sentiment Analysis on Twitter Data using KNN and SVM. International Journal of Advanced Computer Science and Applications, 8(6). https://doi.org/10.14569/ijacsa.2017.080603

40) Rundo, Trenta, di Stallo, & Battiato. (2019, December 17). Machine Learning for Quantitative Finance Applications: A Survey. Applied Sciences, 9(24), 5574. https://doi.org/10.3390/app9245574

41) Saetia, K., & Yokrattanasak, J. (2022, December 22). Stock Movement Prediction Using Machine Learning Based on Technical Indicators and Google Trend Searches in Thailand. International Journal of Financial Studies, 11(1), 5. https://doi.org/10.3390/ijfs11010005

42) Salem, F. M. (2022, January 4). Recurrent Neural Networks: From Simple to Gated Architectures. Springer. https://doi.org/10.1007/978-3-030-89929-5

43) Scholkopf, B., & Smola, A. J. (2018). Learning with kernels: support vector machines, regularization, optimization, and beyond. MIT press.

44) Schumaker, Robert P., et al. "Evaluating sentiment in financial news articles." Decision Support Systems 53.3 (2012): 458-464.

45) Shah, D., Isah, H., & Zulkernine, F. (2019). Stock market analysis: A review and taxonomy of prediction techniques. International Journal of Financial Studies, 7(2), 26.

46) Strader, T. J., Rozycki, J. J., ROOT, T. H., & Huang, Y. H. J. (2020, January 1). Machine Learning Stock Market Prediction Studies: Review and Research Directions. Journal of International Technology and Information Management, 28(4), 63–83. https://doi.org/10.58729/1941-6679.1435

47) Syzdykova, A. (2018), The relationship between macroeconomic variables and the stock market: the case of KASE. Journal of Çankırı Karatekin University, 8(2), 331-354.

48) Syzdykova, A. (2018, October 28). The Relationship between the Oil Price Shocks and the Stock Markets: The Example of Commonwealth of Independent States Countries | International Journal of Energy Economics and Policy. https://doi.org/10.32479/ijeep.7020

49) Thai, L. H., Hai, T. S., & Thuy, N. T. (2012, May 2). Image Classification using Support Vector Machine and Artificial Neural Network. International Journal of Information Technology and Computer Science, 4(5), 32–38. https://doi.org/10.5815/ijitcs.2012.05.05

50) The Fourth Industrial Revolution: what it means and how to respond. (2020, September 22). World Economic Forum. https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/

51) Vargas, M. R., de Lima, B. S. L. P., & Evsukoff, A. G. (2017, June). Deep learning for stock market prediction from financial news articles. 2017 IEEE International Conference on Computational Intelligence and Virtual Environments for Measurement Systems and Applications (CIVEMSA). https://doi.org/10.1109/civemsa.2017.7995302

52) Wang, T., Qiu, R. G., & Yu, M. (2018, June 15). Predictive Modeling of the Progression of Alzheimer's Disease with Recurrent Neural Networks. Scientific Reports, 8(1). https://doi.org/10.1038/s41598-018-27337-w

53) Zhong, X., & Enke, D. (2019, June 15). Predicting the daily return direction of the stock market using hybrid machine learning algorithms. Financial Innovation, 5(1). https://doi.org/10.1186/s40854-019-0138-0

International Format of Financial Reporting XBRL in Kazakhstan

Arman Sarsenov

Abstract

The paper is a descriptive study that investigates the adoption and implementation of the International Financial Reporting Standard XBRL (eXtensible Business Reporting Language) in Kazakhstan, utilizing SWOT, PEST, BCG matrix, and Porter's Five Forces methodologies. A comparative analysis of key economic indicators among countries employing the XBRL format and those that have not yet adopted it is also presented. The results indicate that the development and implementation of XBRL in Kazakhstan offer substantial benefits, including increased efficiency, transparency, and comparability of financial information, which contribute to economic growth and attract foreign investment. The evidence strongly supports the adoption of XBRL in Kazakhstan, contingent on addressing challenges related to training, education, technological infrastructure, and regulatory enforcement.

Introduction

Theoretical Framework

In this context, the theoretical framework will begin with an analysis of the idea of financial reporting and the international regulations governing it. Also emphasized will be the relevance of financial reporting in the global economy, particularly in terms of openness, comparability, and accountability. The next topic has discussed the function of XBRL in financial reporting and its global implementation.

Then, the theoretical framework has delved into Kazakhstan's unique obstacles in applying XBRL for financial reporting. These hurdles to adopting global standards may be political, economic, or cultural in nature. In addition, an evaluation of the advantages and disadvantages of applying XBRL in Kazakhstan and its potential influence on the country's financial reporting system will be done.

The theoretical framework concludes with a discussion of potential solutions to these issues and their implementation in Kazakhstan. These solutions may include policy recommendations, educational programs, or other initiatives aimed at enhancing the nation's financial reporting procedures. The paper's theoretical framework provides a comprehensive understanding of the main concepts, theories, and models associated with the international financial reporting format in Kazakhstan based on the use of XBRL.

Research purpose

The purpose of this dissertation was to investigate the current state of financial reporting in Kazakhstan and to assess the pros and cons of using the eXtensible Business Reporting Language (XBRL) format. The objective of this study was to identify potential obstacles to the successful implementation of XBRL, such as a lack of comprehension of the format, resistance to change, and technological constraints. The study examined the regulatory and institutional framework required for XBRL adoption. The results contribute to the extant literature on financial reporting and accounting standards by illuminating the potential benefits and drawbacks of adopting XBRL in Kazakhstan. The research is relevant to policymakers, regulators, financial institutions, and other parties involved in financial reporting and accounting processes.

The research question is formulated as follows: To what extent does Kazakhstan need to implement the XBRL financial reporting format?

Considered problem

This dissertation investigates the implementation of the XBRL financial reporting format in Kazakhstan, which is an essential issue. eXtensible Business Reporting Language, or XBRL, is a standard for the electronic transmission of business and financial data. Kazakhstan's financial reporting system will be more transparent and efficient as a result of the implementation of this format. Currently, the lack of standardization in Kazakhstan's financial reporting system makes it difficult for investors, creditors, and other stakeholders to compare the financial information of different businesses. This absence of transparency can result in inaccurate financial reporting, which has a negative impact on the economic growth of the country.

XBRL Definition

Extensible Business Reporting Language, abbreviated as XBRL, is an open standard language used for the electronic transmission of commercial and financial data. It facilitates the transfer of financial data between applications and platforms regardless of their technical specifications (Debreceny & Gray, 2001). This language facilitates the generation, analysis, and sharing of financial data in a standard format, making it simpler to compare and analyze data across businesses, industries, and countries (Robinson, 2020). Globally, governmental entities, regulatory authorities, and accounting firms use XBRL to streamline the compilation of financial reports, reduce errors, improve the accuracy and transparency of financial statements, and reduce the number of errors. This language was designed to be flexible and adaptable, allowing businesses to tailor their financial reports to their particular demands and requirements (Watson & Hoffman, 2003). In addition, XBRL has the capacity to automate data collection, processing, and report generation, allowing organizations to save time and money. XBRL is a powerful instrument that revolutionizes the exchange and analysis of financial data, allowing investors, regulatory bodies, and other stakeholders to make well-informed decisions based on precise and timely data (Leuz et al., 2008). Next, for a deeper understanding, every word in the definition of XBRL will be analyzed. Firstly, Business Reporting, as a rule, consists of: tax returns, annual reports, internal sales figures, etc. Each report represents a certain set of facts and data, for example:

1. Reporting period;

2. Annual income;

3. Number of customers;

4. Inventory numbers,

Etc (Weverka & So, 2008).

For many years, to create such reports, it was necessary to collect information on a huge number of paper media. After that, the completed form from these paper carriers was sent to interested parties. The problem lies in the fact that often every interested person, be it a bank, a state organization or an investor company, requires the provision of the necessary data in different formats. Therefore, the report compiler has to fill in the same data several times in different formats. XBRL is a solution to this issue since it improves the process of developing, disseminating, and customizing report data for usage in other sectors (Bolgiano et al., 2009). The XBRL format specifies an electronic reporting format that enables electronic applications to generate, validate, and process reports automatically. It also specifies a method for ensuring that communicated business facts have a unified semantic meaning. The compiler of the report might simply produce a single report including all the information and hand it over to the receiver, who would then choose the facts he needs and display them in any format he wished. Establishing a single semantic interpretation for each information assures that each report receiver perceives the data in the same way (Hodge et al., 2004). Importantly, it is possible to separate the report's format from its substance. The pre-configured report form serves as a template that specifies the factual content. It is made just once by the report receiver. And the information that is developed each time while creating reports consists of the sent facts (Grady et al., 2019).

The XBRL standard utilizes a similar separation (Debreceny & Gray, 2009):

• The so-called taxonomy specifies the ideas in the business field for which reporting is created and describes what should or can be included in the report.

• The data itself is referred to as an XBRL (instance document) report. It contains the transmitted information. The report references the taxonomy to provide context for the information. Each fact contained in the report corresponds to a taxonomy concept.

Extensible comes after the letter X in the abbreviation XBRL. XBRL is extensible, according to a second premise. Returning to the scenario of the established method for collecting and distributing financial statements, the following example is proposed. Assume that the European Union establishes reporting requirements for all EU-based businesses:

1. Such a requirement is likely to be stated in English, but the majority of businesses would prefer to have a reporting form in their native tongue due to the difficulty of translating business terms.

2. It is possible that such reporting requirements are already in place in some nations, possibly with country-specific modifications. In order to avoid having to prepare two distinct forms with overlapping requirements, both forms can be combined into a single form for a particular

country. However, this will necessitate the creation of a new version of the primary form. XBRL helps to support such needs. The EU will establish a single taxonomy for reporting requirements. The so-called label linkbase contains the translation of technical ideas in the taxonomy into language intelligible to the user. Each language inside the EU may have its own database of labels, or a single database including labels for all languages may be created. Note that it is not necessary to repeat the definition of concepts in each language. A nation that wishes to expand the EU taxonomy will simply construct its own taxonomy that refers to the EU taxonomy in terms of broad ideas. It is sufficient for this nation to define only concepts that are not included in the EU taxonomy (Weverka & So, 2008). And the final word in the XRBL definition is Language. The XBRL language provides a method for expressing XBRL taxonomies and reports in a single, clear format, a need for computer processing of data. The XBRL language is founded on international standards including XML and their respective specifications.

Description of the structure and principles of XBRL

Firstly, the idea of taxonomy is often a collection of connected documents known as a Related set of taxonomies. Taxonomy Scheme is the foundation of this complex. This is the document that the XBRL report references. This taxonomy schema may include references to other papers, which may in turn contain references to more documents, etc. Viewing the schema necessitates following all links until all associated papers have been read. Taxonomy can refer to two distinct document types:

1. Taxonomy describes the situation in which one taxonomy (Extended Taxonomy) extends another (Base Taxonomy).

2. Linkbase is utilized to offer more information on taxonomy-defined concepts. Relationships between concepts and between the concept and supplementary information are described in reference databases. There are five primary types of link databases, each of which will be examined in further depth in the following sections (Weverka & So, 2008):

• Definition;

• Calculation;

• Presentation;

• Label;

• Reference.

Schematically, this can be depicted as follows (Weverka & So, 2008):
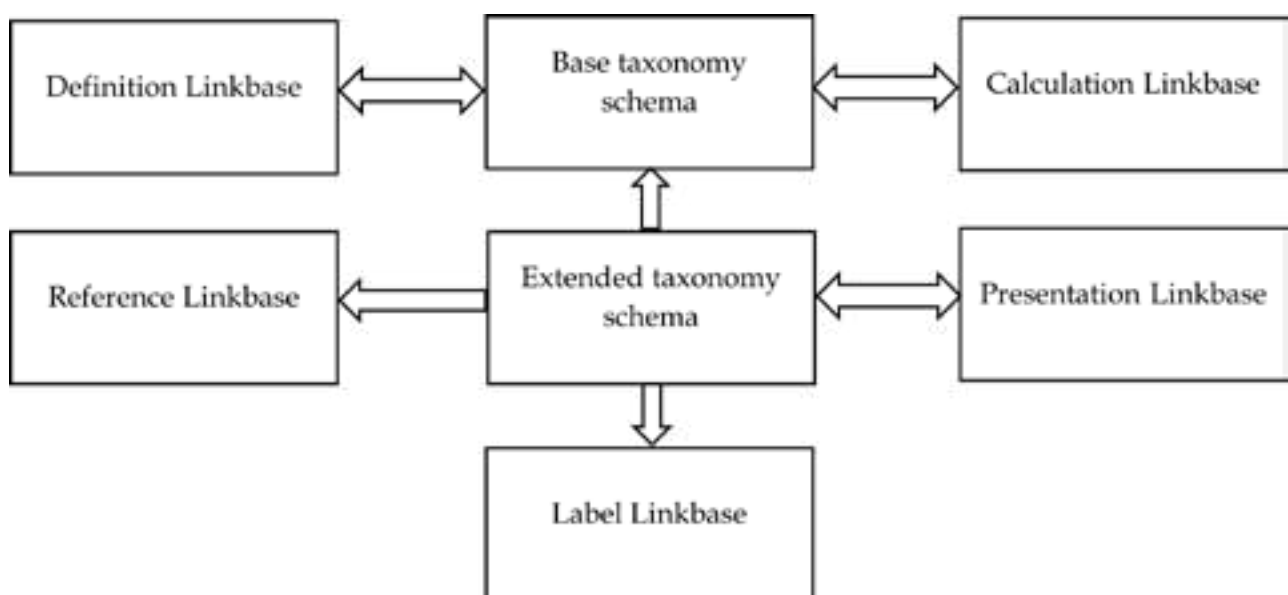

Figure 1. XBRL structure schema

It is important to note that some reference databases (Reference and Label) are unidirectional, i.e. the link leads from the taxonomy to the resources of the reference database. Other reference databases (Definition, Calculation, and Presentation) are bidirectional. Links point from one part of the taxonomy to another part. The core of a taxonomy is its schema, which is a mandatory document. This schema is actually an XML Schema document (a W3C standard that allows you to define the structure of XML documents). The XBRL specification uses XML Schema as the base language for describing taxonomies. On top of this basic language, it defines a set of XBRL-specific additions and restrictions (Cox, 2006).

As part of the taxonomy scheme, it is possible to:

- Import another "basic" taxonomy allowing you to construct extensions of existing taxonomies;
- Specify the concepts for which reports will be generated;
- Define the roles used in reference databases; Access the reference databases.

The XBRL information model is composed primarily of two components: the XBRL report (XBRL instance) and the XBRL taxonomy. A taxonomy is a definition of particular facts, including their syntax, form, and characteristics. An XBRL report contains specific facts, and a taxonomy is a definition of those facts. XBRL instances include specific business information. The most fundamental element of which is the fact (facts). For instance, "Sales during the previous quarter" is a fact. Objects are simple facts without sophisticated information systems.

A set of related facts can be aggregated and represented using relatively complicated structures, such as tuples, to describe increasingly complex information units. A tuple may include both items and additional tuples. An illustration is used to illustrate the report's specifics. The taxonomy determines the language standards that these specific facts must adhere to, as well as their forms and signs. The taxonomy should first identify the elements of the financial statements to be used in the financial statements, then add other pertinent information such as the relationship between each element, as well as the name and position of each element in the report, and reflect the accounting standards by which the financial statements are prepared. The XBRL taxonomy consists of the Taxonomy

Schema (.xsd) file as well as five database reference files: calculation, definition, label, display, and reference. The classification file specifies a variety of items, such as element names, ID attributes, element kinds, etc., and describes the mathematical and defining connections between them. "Restrict and regulate. The calculation database reference file defines the link between projects from the perspective of data calculation; for instance, the idea of "profit after tax" is derived by subtracting "profit tax" from "profit before tax." User must construct a database link file to comprehend the conceptual ties between projects, such as general and special relationships: "postalCode" is a generalization of "zipCode," etc.; the tag database link file determines the actual display of the project in the name of the financial report. For instance, user may utilize a tag link to associate the text string "total income for the previous year" with the record "RMRY" defined in the category. The financial report defines the display database reference file to unify the order in which all sub-elements of the parent element are presented; for instance, in the presentation report, sales and sales should be displayed as parent-child relationships.

Similar to the tag database link file, accessing the reference information of the database link file to identify an element with which the user can properly comprehend the true meaning of the element. XBRL is an XML-based cross-platform data transmission standard; hence, if the user's browser supports XML, he may see and download financial reports in XBRL format similarly to how he views web pages in HTML format. Modern web browsers all support XBRL. Some software providers, including SAP, ORACLE, and ACCPAC, have currently integrated the ability to generate XBRL documents into their software packages. If the enterprise's software does not support XBRL, XBRL financial statements can be generated using proprietary or third-party applications such as Excel2003, ExcelXP, etc.

Main application areas of XBRL

XBRL has a vast variety of applications in economic activity, which may be condensed into the six areas below:

1. The field of business administration. With XBRL, the company's management may swiftly gather and assess the financial status of several departments and affiliated businesses. In addition, this information may be swiftly gathered to secure market support. In addition, as an information

provider, a business can use XBRL technology to complete the conversion of the XBRL format in a single step using a specialized application program for format conversion (Valentinetti & Rea, 2011). Previously, this process required the submission of written financial reports, online financial information, or uploading to the relevant competent authorities. The data processing operation need not be performed multiple times.

2. Audit area. It is possible to enhance the process of creating and checking financial statements (Valentinetti & Rea, 2011). The most significant advantage of using XBRL for unified disclosure of corporate financial information in corporate financial reports for audit organizations is that it is no longer necessary to manually interpret data in different formats; instead, it is possible to directly obtain the content of financial data disclosed by clients. through conventional uses. It can also be connected to a single XBRL-formatted economic database of the organization (Valentinetti & Rea, 2011). If each company verifies that the system is well-controlled and logically sound, they are able to undertake continuous activities in real time. audits and field audits conducted electronically. Therefore, lowering the amount of manual activities and enhancing the audit's efficiency and quality.

3. The extent of the company's credit rating evaluation. Businesses, banks, and credit rating agencies are able to obtain the credit rating status of relevant buyers, sellers, and financial institutions more quickly than in the past (Valentinetti & Rea, 2011).

4. The realm of the securities market First, ordinary investors can obtain financial data of businesses more quickly, precisely, and conveniently. Internet-obtained data may be utilized immediately for analysis by expert investment analysts, and the desired output format can be selected to increase the efficiency of data gathering and analysis, therefore reducing the amount of repeated labor necessary. The cost and duration of data processing are crucial. If all listed businesses adopt the XBRL format to replace the present PDF format for electronic files, securities management agencies may execute the download of textual materials and data at the same stages, and each firm can upload its files. It can be directly checked, compared, and analyzed if it is in the same format, and disclosure, transparency, and equity can be achieved with minimal expense.

5. The realm of commerce and taxation. Using XBRL, the tax return materials of each enterprise can be directly generated from the same database used by the company to prepare financial statements, without the need for additional data preparation, and can be directly transmitted to various tax authorities via the Internet in order to implement a paperless tax return (Halim et al., 2015). In addition to effectively preventing data entry errors caused by the human factor and improving the efficiency of the tax department, it can also reduce the difficulties associated with the fact that the taxpayer must contact the tax unit in person to declare the tax during the filing period of the declaration (Halim et al., 2015).

6. The discipline of financial management. While investigating financial trends and monitoring the risks of financial institutions, departments of financial management can also utilize XBRL successfully. The government can design standard forms and formats of XBRL documents for various government agencies and non-profit organizations and upload them on publicly accessible government websites so that companies can use them to submit information (Halim et al., 2015). In the future, documents and forms will be in XBRL format. Standardized documents that can streamline the document processing operations of government or nonprofit organizations. XBRL will streamline existing electronic bond procedures and implement the harmonization of business financial data and the tax department's data interface. In addition, accounting papers, applicable legislation, and other materials saved in the XBRL file format can only be understood using a standard web browser, which facilitates maintenance and automatic search.

Literature Review

The literature review commences with a brief overview of several foundational sources, which provide the essential information needed to understand the basics. "XBRL: The New Language of Business Reporting" by Liv Watson and Charlie Hoffman (2003) serves as an excellent starting point. This work is rightly considered one of the earliest XBRL-focused publications. This book elaborates on what XBRL is and how its implementation can enhance the efficiency of the financial sector.

At the beginning of the book, the main issues and shortcomings of the currently accepted method of financial reporting are highlighted. Here, the authors emphasize the difficulties associated with comparing the reports of various organizations, as well as the high cost and potential risks involved in processing quantitative and textual data. Furthermore, they present some solutions to these aforementioned problems with the innovative financial reporting format XBRL. This source is valuable as it details the origins of this format, its evolution over time, and the initial stages of its implementation. The authors thoroughly demonstrate how XBRL can be used to automate and standardize financial reporting for better inter-organizational communication. Additionally, they underline the benefits of using the format for various financial institutions. One of the major strengths of the book is its practical nature. The authors provide numerous examples of XBRL in action, as well as guidelines for preparing and using financial reports with XBRL tags. Moreover, they address common challenges and concerns related to XBRL implementation, such as data quality, taxonomy creation, and software compatibility.

The next source is "XBRL for Dummies" by Diana Muller and Charles Hoffman (2009). This book offers an introduction to eXtensible Business Reporting Language (XBRL). The book provides an overview of XBRL and explains how it can be used to improve financial reporting and analysis. The first part of the book introduces financial reporting and the issues associated with traditional reporting methods. Then, it introduces XBRL and describes its structure and capabilities in simple language. The authors present examples of financial reports using XBRL tags and explain how they can be used to automate the exchange of financial data across organizations. One of the strengths of the book is its accessibility. The writers use plain language and avoid technical jargon, making the text more approachable to readers without a background in accounting or technology. Additionally, they provide various examples and illustrations to help readers understand the topics presented.

Following this, the research paper titled "The Effect of XBRL on Financial Reporting" by Richard A. Hicks and Susan M. Williams (2011) is selected for examination. This paper focuses on the challenges of implementing the XBRL format at the corporate and governmental levels. As a result, it highlights the difficulties associated with the processes of integrating different taxonomies, the issues related to the cost of implementing this format, and the potential problems concerning the presentation quality of financial reporting data. The authors argue that the full potential of the XBRL format can only be realized if it is widely disseminated among all parties involved.

The study article "XBRL and Financial Analysis" by Christian Lenz, Robert Libby, and Peter Wysocki (2008) examined the possible influence of the extensible Business Reporting Language (XBRL) on financial analysis. The authors began by discussing the present status of financial analysis and the constraints of conventional financial reporting. They then presented XBRL as a potential solution to these limitations and discussed the advantages of using XBRL-tagged financial data for financial analysis. Possible benefits of applying XBRL for financial analysis were outlined in this document. For instance, it could enhance the comparability of financial statements across industries and firms, making it easier for investors and analysts to analyze performance. It could also minimize the time and resources required to acquire and analyze data, and increase the quality and dependability of financial data.

The aforementioned sources provided a general understanding of the theoretical component necessary to immerse oneself in the study topic. This information allowed for initial inferences to be drawn. The sources clarified what financial statements are, the formats in which they are presented, and their primary advantages and disadvantages. Furthermore, the technical aspects of XBRL were explained in detail in the "XBRL Implementation Guide" by Mark Bolgiano, Campbell Pryde, and Anne B. Botos (2009), which offered a comprehensive review of XBRL and its potential benefits, as well as guidance for integrating XBRL into financial reporting procedures. The guide provided a step-by-step approach to using XBRL in financial reporting procedures, which included defining taxonomy, labeling with XBRL, and validating. It also provided recommendations for integrating XBRL into current financial reporting systems and processes.

The research paper "XBRL and Financial Reporting Quality: Evidence from China" by Qiang Cheng, Ying Chou Lin, and Xiaohong Xu (2016) examined the application of the XBRL format in China. A sample of Chinese companies

that had implemented XBRL was compared to a control group of companies that had not. The authors analyzed financial statement quality indicators, such as profit management, timely recognition of losses, and audit reports, to investigate the impact of XBRL on financial reporting quality. The results revealed that companies that had adopted XBRL had higher-quality financial reporting than those that had not. The implementation of XBRL was associated with a decrease in profit management, an improvement in the timeliness of loss recognition, and an increase in the probability of achieving an unqualified audit opinion. The study also examined the influence of business size on the relationship between XBRL implementation and financial reporting quality and found that the impact was greater for smaller businesses. This study highlights the potential of XBRL to enhance the accuracy and reliability of financial reporting and its implications for decision-makers who rely on financial information.

The research paper entitled "Impact of XBRL adoption on financial reporting quality: A global evidence" by Tawiah and Borgi (2018) is a key source for this paper. The authors examine the impact of XBRL adoption on financial reporting quality using a sample of companies from different countries. The study presents actual evidence of the potential impact of XBRL on financial statement quality, which is of great importance for regulators, investors, and other decision-makers who rely on accurate and trustworthy financial information. However, the study did not include Kazakhstan in its sample. Therefore, this work aims to contribute to the literature by comparing the impact of XBRL adoption on financial reporting quality in Kazakhstan with the results of the study by Tawiah and Borgi. The findings of this research will provide insights into the implementation of XBRL in Kazakhstan and its impact on the quality of financial reporting.

Methodology

Research Methodology

This study combines quantitative and qualitative data collection and analysis using a mixed methods methodology. The study collects data from publicly available official sources. The sources are listed below. The main focus is on existing academic papers and publications.

SWOT Analysis

A SWOT analysis was chosen as the first method of analysis. It provides a framework for identifying and analysing the strengths, weaknesses, opportunities and challenges associated with the implementation of XBRL in Kazakhstan. It helps to gain a fuller understanding of the elements that may affect the success or failure of XBRL implementation in the country.

Strengths	Weaknesses
1. Enhanced financial reporting accuracy and transparency; 2. Improved comparability of financial data; 3. Streamlined regulatory compliance; 4. Increased efficiency in processing and sharing financial info; 5. Promotion of digital transformation in Kazakhstan.	1. Limited awareness and understanding of XBRL; 2. High initial implementation costs; 3. Insufficient IT infrastructure and technical expertise; 4. Resistance to change due to complexity.
Opportunities	**Threats**
1. Strengthening the national financial reporting framework; 2. Facilitating foreign investment; 3. Enhancing monitoring and supervision capabilities; 4. Leveraging XBRL for advanced analytics and decision-making.	1. Slow or uneven adoption of XBRL; 2. Potential for data security and privacy breaches; 3. Challenges in maintaining quality and consistency of data; 4. Risk of XBRL implementation being overshadowed by other factors.

Table 1. SWOT analysis of XBRL

Strengths: The implementation of XBRL in Kazakhstan has several strengths. First, it improves the precision and openness of financial reporting, which is essential for fostering investor confidence. XBRL also enhances the comparability of financial data across companies and industries, making it simpler for investors, analysts, and regulators to analyze financial data. Thirdly, it facilitates regulatory compliance and reduces the reporting burden on companies, thereby enhancing the reporting process's efficacy. The implementation of XBRL improves the processing, analysis, and dissemination of financial data, which is essential for making informed decisions (Leuz et al., 2008). Lastly, the implementation of XBRL promotes innovation and competitiveness by contributing to the digital transformation of Kazakhstan's corporate environment.

Weaknesses: Despite its potential benefits, there are several disadvantages associated with the implementation of XBRL in Kazakhstan. XBRL's adoption and use may be slowed by enterprises' and stakeholders' lack of understanding and familiarity with the format (Joshi, 2010). Some businesses may be dissuaded from employing the reporting standard by the high initial implementation costs, particularly for small and medium-sized businesses (SMEs). Limited IT infrastructure and technical knowledge to support XBRL implementation can hinder the reporting language's successful implementation (Joshi, 2010). In addition, enterprise resistance to change due to the complexity of XBRL may hinder the standard's widespread adoption.

Opportunities: The introduction of XBRL in Kazakhstan presents several opportunities for the country. It can help strengthen the national financial reporting system and bring it in accordance with international standards, such as those established by the IFRS Foundation. Better financial reporting and data comparability can help attract foreign investment, thereby contributing to economic growth. Moreover, the implementation of XBRL can improve the surveillance and supervision capabilities of regulators, assuring compliance and reducing risk in the financial sector. Using XBRL for complex analytics and decision assistance can provide enterprises, investors, and policymakers with valuable information (Hicks & Williams, 2011).

Threats: Several threats could undermine the successful implementation of XBRL in Kazakhstan. Delayed or inconsistent XBRL implementation in the business sector may reduce its efficacy and influence (Cox, 2006). Due to digital reporting's vulnerabilities, data security and privacy breaches may occur. Ensuring the quality and consistency of XBRL-labeled financial data can be difficult, potentially impacting the accuracy and dependability of financial data (Bolgiano et al., 2009). In Kazakhstan, the possibility that XBRL implementation will be overshadowed by competing demands or regulatory changes could threaten the standard's long-term implementation and success. After identifying the strengths, weaknesses, opportunities and threats associated with XBRL implementation in Kazakhstan, the data is used to better understand the elements that may affect the success or failure of XBRL implementation in the country. This helps identify potential barriers to implementation. It also helps identify areas where XBRL implementation can be most effective.

BCG Matrix analysis

Lucian Cristian Eni in his work "Empirical Research: Exploring Extensible Business Reporting Language and Views of Romanian Accountants" conducted a survey among auditors, including a number of questions. The auditors' answers to one of the questions will be used to build the BCG matrix. Lucian Cristian Eni administered an online questionnaire to 250 recipients, consisting of certified accountants and accountants who are also certified auditors. Out of the 250 recipients, only 16 responses were received, which represents roughly 7% of the total sample size. The sample population was selected from two sources:
• Randomly chosen from the member database of CECCAR, which stands for the Chamber of Certified Accountants.
• Sampled from the member database of CAFR, which stands for the Chamber of Financial Auditors. Specifically, the sample was drawn from the subset of members who are both certified public accountants (members of CECCAR) and certified auditors (members of CAFR).

The second question on the online questionnaire asked the respondents to indicate the format in which the company they work for, or for which they do accounting, has published financial/non-financial data. The results are presented in the table below (Eni, 2015):

	Hardcopy	PDF	HTML	Excel	CSV	XBRL	XML	Other formats
Balance Sheet	12.5%	75%	0.00%	0.00%	0.00%	0.00%	12.5%	0.00%
Profit and Loss Statement	18.75%	68.75%	0.00%	0.00%	0.00%	0.00%	12.5%	0.00%
Cash Flow Statement	25%	37.5%	0.00%	31.25%	6.25%	0.00%	0.00%	0.00%
Notes to Accounts	12.5%	31.25%	0.00%	25%	31.25%	0.00%	0.00%	0.00%
Trial Balance	31.25%	37.5%	0.00%	18.75%	0.00%	0.00%	0.00%	12.5%
Directors`Report	18.75%	18.75%	0.00%	6.25%	56.25%	0.00%	0.00%	0.00%
General Ledger	31.25%	31.25%	6.25%	6.25%	0.00%	0.00%	0.00%	25%
Day Book	31.25%	31.25%	6.25%	6.25%	0.00%	0.00%	0.00%	25%
Suppliers and Customers Ledger	31.25%	31.25%	6.25%	12.5%	0.00%	0.00%	0.00%	18.75%

Table 2. Distribution of formats by use in reporting

Based on the responses received, it appears that accountants primarily use the "first generation of digital reporting," where reports are published and disseminated online in essentially the same formats as their hard-copy versions. The two most common internet reporting formats used are Portable Document Format (PDF) and Hyper-Text Mark-up Language (HTML). The electronic format of the annual financial statements typically includes a PDF file with an attached XML file and a zip file that contains various forms. This type of PDF file is also referred to as an "intelligent" PDF because it enables several checks thanks to its XML features. The mandatory PDF file generated by software is most likely used by accountants to disseminate information within the online environment, or other conversion software may be used to obtain the PDF file. It was found that the most frequent format used for publishing all reports is PDF, with the exception of the Director's Report, which is primarily a CSV document. In some cases, Microsoft Excel is used as a format, particularly for general ledger, day book, and suppliers/customers ledger. These reports are also published in other formats than those mentioned, but PDF remains the most common format for financial statements (Eni, 2015).

This was followed by a BCG (Boston Consulting Group) matrix study to assess the market growth potential and market share of XBRL.

Format	Market Share	Market Growth
XBRL	Low	High
PDF	High	Low
Excel	High	Low
CSV	Low	Low
HTML	Low	Low

Table 3. BCG Matrix analysis of XBRL

Using the table above, we can place each financial reporting format in the BCG matrix:
- Stars (High Market Share, High Market Growth Rate): PDF
- Cash Cows (High Market Share, Low Market Growth Rate): Excel
- Question Marks (Low Market Share, High Market Growth Rate): XBRL.
- Dogs (Low Market Share, Low Market Growth Rate): CSV, HTML

XBRL has gained popularity in recent years. Various regulators, including the U.S. Securities and Exchange Commission (SEC), the European Securities and Markets Authority (ESMA), and the International Accounting Standards Board (IASB), have approved XBRL as a reporting standard (XBRL International, SEC, ESMA.). As a result, low XBRL's market

share and growth rate are considered high. PDF (Portable Document Format) is a popular format for presenting financial reports because it preserves the document's layout and formatting regardless of the viewing device. PDFs are less appropriate for data analysis and extraction due to their unstructured and inert nature. PDFs remain a popular option for financial reporting despite their limitations due to their accessibility and user-friendliness. Thus, PDFs have a high market share while the market development rate is modest (Pinsker & Li, 2008).

Microsoft Excel is an application for creating and editing spreadsheets. Excel is extensively utilized for financial reporting due to its adaptability, user-friendliness, and compatibility with numerous accounting software packages. However, its lack of standardization and human error risk limit its growth potential. Therefore, Excel's market share is considerable despite its market growth rate being modest (Pinsker & Li, 2008).

CSV (comma separated values) is a straightforward text format that uses commas or other delimiters to separate data. While CSV files are simple to process and analyze, the lack of strict formatting standards makes it difficult to standardize and maintain data consistency. Consequently, CSV's market share and growth rate are minimal (Pinsker & Li, 2008).

HTML (HyperText Markup Language) is a markup language used to construct Web pages. Financial reports can be presented as web pages, allowing browsers to access them. HTML documents, like PDFs, are immutable and unstructured, making it challenging to analyze and retrieve data. Thus, HTML's market share and growth rate are minimal (Pinsker & Li, 2008).

Using BCG matrix analysis, it is simpler to comprehend the position of XBRL on the Kazakhstan market and to identify potential implementation and expansion options. Moreover, it assists in identifying potential risks and possibilities related with the adoption of XBRL in Kazakhstan, depending on the country's market position and growth potential.

Porter's five forces analysis

The competitive environment surrounding the adoption of XBRL in Kazakhstan was analysed at a deeper level using Porter's five forces method:
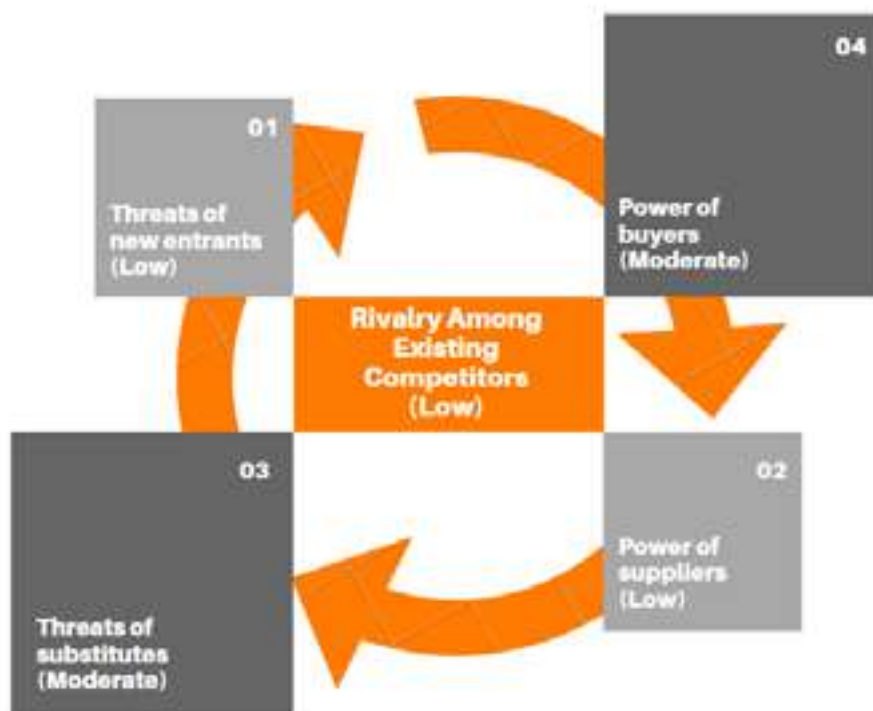

Figure 2. Porter's five forces analysis of XBRL.

Threat from new entrants (Low): Threat from new entrants refers to the probability that new competitors will enter the market and challenge the current status quo of XBRL implementation in Kazakhstan. The analysis reveals a minimal threat from new entrants, predominantly as a result of several entry barriers. Companies, particularly small and medium-sized enterprises (SMEs), are deterred from adopting XBRL because of the high initial implementation costs. Inadequate IT infrastructure and technical expertise can also prevent new entrants from entering the market (Joshi, 2010). In addition, regulatory obstacles, such as mandatory reporting standards and compliance requirements, restrict the number of new entrants (Debreceny, Gray, & Rahman, 2002).

Bargaining Power of Suppliers (Low): refers to the capacity of vendors, such as XBRL software vendors and consultants, to exert influence over the implementation of XBRL in Kazakhstan. Due to the limited number of XBRL software vendors and consultants, the analysis reveals that vendors have limited bargaining power. Moreover, relying on international XBRL organizations, such as the IFRS Foundation, for taxonomy revisions and recommendations diminishes the negotiating position of local vendors (IFRS Foundation, 2021). In addition, companies that have already invested in XBRL-compliant systems are less likely to transfer vendors due to high switching costs (Joshi, 2010).

Bargaining Power of Buyers (Moderate): The bargaining power of purchasers, such as businesses and other stakeholders, indicates their capacity to influence the implementation and adoption of XBRL in Kazakhstan. This analysis indicates that consumers have moderate bargaining power. XBRL can provide companies and stakeholders with accurate and transparent financial reporting. For effective oversight, regulators require standardized and comparable financial data, which further motivates the adoption of XBRL (Debreceny et al., 2002). However, if the expense associated with implementing XBRL is too high, businesses might choose for alternative financial reporting solutions, which could weaken their negotiating position.

Threat of Substitute Products or Services (Moderate): The threat of substitute products or services refers to the possibility that other digital reporting formats will replace XBRL. The analysis indicates that substitute products or services pose a moderate threat. Some businesses might contemplate PDF or Excel as alternatives to the XBRL format (Leuz et al., 2008). Due to their unique requirements, some companies may favor customized internal financial reporting systems (Joshi, 2010). Rapid advances in financial technology could also result in the creation of new reporting solutions that challenge XBRL's dominance.

Competitive Rivalry among Existing Competitors (Low): Competitive rivalry among existing competitors reflects the degree of competition among businesses implementing XBRL in Kazakhstan. This analysis indicates minimal competition, as XBRL has become a globally recognized standard for digital financial reporting (Bolgiano et al., 2009). Support for XBRL implementation by the National Bank of Kazakhstan decreases the possibility of competition.

The analysis of Porter's Five Forces is enhancing comprehension of the competitive environment surrounding the adoption of XBRL in Kazakhstan. The opportunities and risks involved in the SWOT analysis from the other side has been disclosed here.

PEST analysis

The final analysis included a PEST assessment. It served as the basis for an analysis of the political, economic, social and technological aspects that may affect the adoption of XBRL in Kazakhstan.
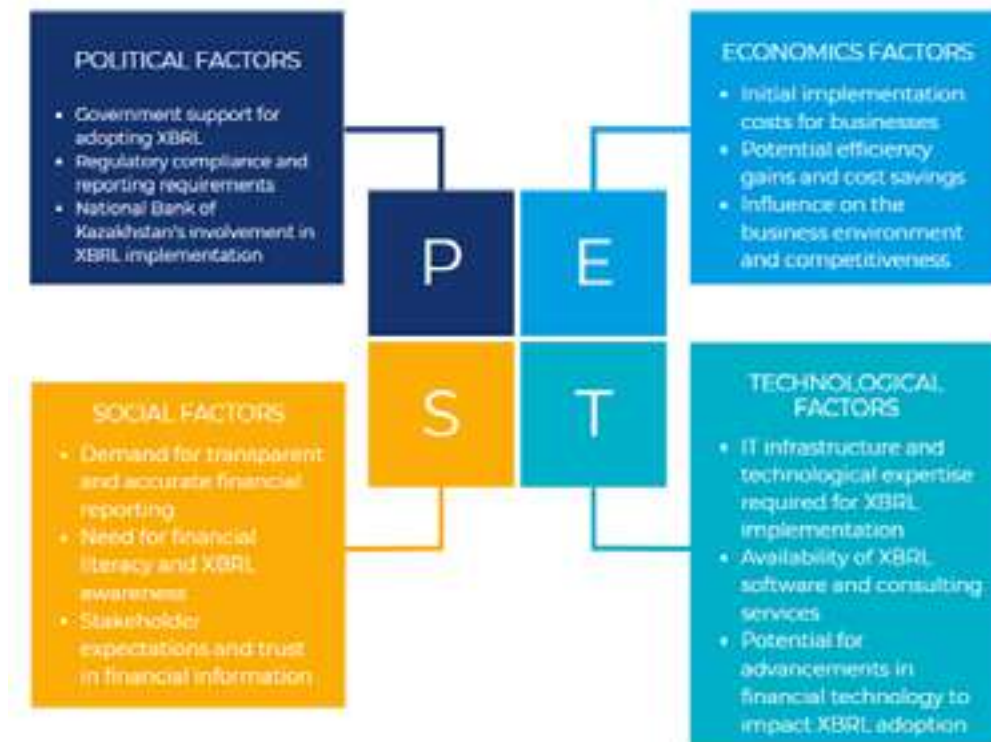
Figure 3. PEST analysis of XBRL.

Political Factors: the adoption of XBRL in Kazakhstan may be influenced by political factors such as government support, regulatory compliance, and the involvement of the National Bank of Kazakhstan in the implementation process. The government of Kazakhstan has committed to employing XBRL as the standard for digital financial reporting. Compliance with regulations and reporting requirements in Kazakhstan can encourage the adoption of XBRL because it offers a standardized and comparable format for financial data (Debreceny, Gray, & Rahman, 2002). The National Bank of Kazakhstan's participation in the implementation of XBRL may also encourage the adoption of this reporting standard, as it can provide businesses and stakeholders with guidance and support.

Economic Factors: initial implementation costs for businesses, potential efficiency gains and cost reductions, and the impact on the business environment and competitiveness are economic factors that may influence the implementation of XBRL in Kazakhstan. XBRL implementation can be expensive for businesses, particularly small and medium-sized businesses (SMEs). However, the potential gains in efficiency and cost savings from using XBRL can be substantial over time (Joshi, 2010). Furthermore, the implementation of XBRL may have an impact on the competitiveness of Kazakhstan's enterprises, as it may facilitate access to global financial markets and increase transparency (Cox, 2006).

Social Factors: the demand for transparent and accurate financial reporting, the need for financial literacy and awareness of XBRL, and stakeholder expectations and confidence in financial information are social factors that may influence the implementation of XBRL in Kazakhstan. XBRL facilitates businesses and constituents in Kazakhstan's demand for transparent and accurate financial reporting. However, financial literacy and XBRL awareness may need to be increased in the country to assure its effective implementation. Additionally, stakeholder expectations and confidence in financial information may motivate the adoption of XBRL as a standardized and reliable reporting format (Debreceny et al., 2002).

Technological factors: may impact the implementation of XBRL in Kazakhstan include the IT infrastructure and technological expertise required to implement XBRL, the availability of XBRL software and consulting services, and the potential for financial technology developments that may impact XBRL implementation. Implementing XBRL requires a substantial IT infrastructure and technical expertise, which can be an impediment. XBRL implementation may also be affected by the availability of XBRL software and consulting services in the country, as businesses require access to these resources to implement the reporting

standard. In addition, financial technology advancements may have an impact on XBRL adoption, as new reporting solutions may arise to challenge its dominance (Cox, 2006).

Data analysis

Selection of indicators

To review the information that the introduction and use of the XBRL financial reporting format has a positive impact on the economic and accounting environment in the country, we use an indicator - the World Economic Forum Index of Auditing and Reporting Standards. Currently, this index covers 140 countries with developed and developing type of economy. This analysis will be based on the assessment already made by Tawiah, V. & Borgi in "Impact of XBRL adoption on financial reporting quality: A global evidence". This paper will collect more recent data on the analyzed indicators, as well as will be compared with the data collected separately for Kazakhstan. The 140 countries covered by the Audit and Reporting Standards Index are reduced to a sample of 86 countries with publicly available macroeconomic indicators (Table 3). Of the 86 countries represented, only 34 countries have implemented the XBRL format at the state level. In 52 countries, the format is either partially implemented, in the process of being implemented, or not implemented at all.

Albania	Panama	Kazakhstan	Mexico
Armenia	Paraguay	Kenya	Mongolia
Australia	Peru	Kuwait	Montenegro
Austria	Philippines	Kyrgyz Republic	Morocco
Bangladesh	Poland	Latvia	Mozambique
Barbados	Portugal	Lebanon	Netherlands
Belgium	Romania	Lesotho	New Zealand
Benin	Russian Federation	Lithuania	Nicaragua
Botswana	Rwanda	Luxembourg	Nigeria
Brazil	Saudi Arabia	Madagascar	Norway
Brunei Darussalam	Senegal	Malawi	United Kingdom
Bulgaria	Serbia	Malaysia	Uruguay
Burkina Faso	Singapore	Malta	Zambia
Cambodia	Slovak Republic	Mauritius	Zimbabwe
Cameroon	Slovenia	Ukraine	Trinidad and Tobago
Canada	South Africa	Jamaica	Tunisia
Chile	Spain	Jordan	Turkiye
Colombia	Sri Lanka	Italy	Uganda
Costa Rica	Sweden	Hungary	India
Cote d'Ivoire	Switzerland	Iceland	Indonesia
Croatia	Tanzania	Israel	
Czechia	Thailand	Ireland	

Table 4. List of countries

For a more extensive assessment of the impact of the implementation of the XBRL format on the economic performance of the country, empirical data was collected on several indicators. The following is an overview and rationale for the selection of each indicator:

1.   The Strength of Auditing and Reporting Standards (SARS) Index of the World Economic Forum (WEF) is an indicator of the integrity of financial reporting and auditing practices in a country. It is based on a survey of business executives who ranked the rigor and quality of these practices on a scale from 1 (least rigorous) to 7 (highest quality) (highest). The index can

be regarded an indicator of the integrity of financial reporting for a number of reasons:

- Regulatory framework: In general, a higher SARS score indicates that a country has a robust set of regulations with accounting and auditing standards that are associated with international norms, such as International Financial Reporting Standards (IFRS) and International Standards on Auditing (ISAs). These standards aid in ensuring consistent and transparent financial reporting, thereby enhancing the quality of financial reporting.

- Auditor independence and professionalism: a higher SARS score means that auditors in a particular country are effectively capable of performing objective, impartial audits, which is essential for enhancing the credibility of financial reports.

- Disclosure requirements: the SARS index considers the sufficiency of a nation's disclosure requirements. A higher score indicates that a country's financial reporting practices comply with strict reporting standards, assuring investors, creditors, and other stakeholders of timely and accurate disclosure.

- Enforcement mechanisms: the SARS index reflects a country's effective enforcement mechanisms. Robust enforcement practices indicate that noncompliance with financial reporting standards is less likely to go unrecognized, which can act as a deterrent against fraudulent practices and contribute to the improvement of financial reporting.

- Investor confidence: the SARS index reflects a country's effective enforcement mechanisms. Robust enforcement practices indicate that noncompliance with financial reporting standards is less likely to go unrecognized, which can act as a deterrent against fraudulent practices and contribute to the improvement of financial reporting.

2. XBRL adoption (XBRL). XBRL implementation is measured as a binary variable, similar to other recent accounting developments such as International Financial Reporting Standards. XBRL assigns a value of 1 to adopting countries and a value of 0 to non-adopting nations. XBRL adoption data is obtained from the global XBRL adoption website.

3. Accounting globalization. It refers to the increasing harmonization and integration of international accounting practices, principles, and standards. Adoption of International Financial Reporting Standards (IFRS) and International Auditing Standards (ISAs) plays a crucial role in advancing the globalization of accounting. The status of IFRS and ISA adoption can be used as an indicator of globalization in accounting for the reasons given:

- Common accounting language: Adoption of IFRS and ISA encourages uniformity and comparability of financial reporting across nations by providing a common accounting language. This harmonization of accounting practices facilitates cross-border financial analysis and facilitates a greater level of comprehension among investors, creditors, and other parties, thereby supporting to globalization.

- Enhanced comparability: The use of IFRS and ISA helps create comparable financial statements across different jurisdictions. This comparability makes it easier for investors to evaluate investment opportunities across borders, which can lead to increased cross-border capital flows and greater economic integration among countries.

- Improved transparency: The adoption of IFRS and ISA senhances the transparency of financial reporting by mandating companies to provide more comprehensive and current data. This increased transparency enables stakeholders to assess the financial health of companies regardless of their location more accurately, furthering the globalization of accounting.

- Reduction in information asymmetry: Adoption of IFRS and ISA significantly minimize information asymmetry between nations by establishing a level playing field with respect to financial reporting standards. As a result, cross-border investment and cooperation can be encouraged, as investors will have more confidence in the quality and comparability of financial data.

- Facilitation of multinational operations: The widespread adoption of IFRS and ISAs facilitates the operations of multinational corporations by minimizing the complexities associated with complying with numerous accounting standards in various jurisdictions. This contributes to the globalization of business and facilitates mergers and acquisitions across international borders.

- Regulatory cooperation: Adoption of

IFRS and ISAs encourages regulatory cooperation between nations, as regulators collaborate to ensure uniform application and interpretation of the standards. This collaboration can result in a more globalized and integrated accounting environment.

4. Six World Governance indicators as a measure of Institutional quality. The World Bank's World Governance Indicators (WGI) initiative provides a comprehensive framework for measuring institutional integrity in various countries. The World Governance Indicators (WGI) consists of six essential indicators that reflect various aspects of governance and institutional quality. These characteristics include:

- Voice and Accountability: this indicator measures the extent to which a country's citizens can elect their government, as well as their freedom of expression, association, and access to independent media. High scores on voice and accountability indicate that a country has robust democratic institutions and respects fundamental human rights, contributing to the overall character of institutions.

- Political Stability and Absence of Violence/Terrorism: this indicator reflects the probability of political instability or politically motivated violence, such as terrorism. A high score in this area indicates a political environment that is stable and less prone to conflict, which can provide a firm foundation for good governance and strong institutions.

- Government Effectiveness: This indicator evaluates the character of public services, the capacity of the public service, the degree of independence from political pressure, and the overall quality of policy formulation and implementation. Higher metrics of government efficacy indicate that a country's institutions are effective and able to provide quality public services, which is crucial for the quality of institutions as a whole.

- Regulatory Quality: This indicator measures the government's capacity to devise and implement solid policies and regulations that foster private sector growth. High indicators of government effectiveness indicate that a country has a favorable business climate with clear and consistent norms that support the development of the private sector and contribute to the overall quality of its institutions.

- Rule of Law: This indicator reflects the extent to which agents have faith in and abide by the norms of society, such as the quality of contract enforcement, property rights, police and tribunals, and the likelihood of crime and violence. High scores in the rule of law indicate a robust legal framework, efficient law enforcement, and impartial judicial systems, all of which are essential for preserving institutional quality.

- Control of Corruption: This indicator measures the extent to which state power is used for private benefit, including both minor and significant forms of corruption as well as the capture of the state by elites and private interests. Low levels of corruption, as indicated by high scores in this area, contribute to greater transparency, trust, and efficacy of state institutions, which is essential for the quality of institutions as a whole.

5. Gross National Product (GNP) per capita as a measure of economic development. It can serve as a measure of economic development and a proxy for financial reporting quality for the following reasons:

- Measure of economic development: GNP per capita reflects the average income of a country's residents and serves as a measure of their standard of living. A higher GNP per capita shows a more advanced economic development, as it demonstrates that the average resident of a country has more resources and greater purchasing power.

- Attraction of foreign investment: A higher GNP per capita can entice foreign investors who view the country as having favorable economic prospects and a stable business climate. To maintain this confidence and attract additional investment, countries with a higher GNP per capita have an incentive to improve their financial reporting practices by assuring their financial reporting's transparency and credibility.

- Access to global markets: Countries with a higher per capita GNP are more likely to engage in international commerce and have access to global markets. This access raises the importance of high-quality financial reporting, as companies must follow to international accounting standards and provide accurate, transparent

data to global investors and stakeholders.

6. Secondary school enrollment rate as a measure of education level. It refers to the percentage of the relevant age group enrolled in secondary education. While it may not have a direct relationship with financial reporting quality, it can still serve as an indirect proxy for several points:

- Access to higher education: Higher high school enrollment rates can increase access to postsecondary education, including accounting, finance, and related fields. This access can contribute to the development of a population of qualified professionals who are equipped to maintain high-quality financial reporting.

- Economic development: There is an association between a country's high school enrollment rates and its overall economic development. As mentioned in previous statements, countries with higher levels of economic development tend to have more developed financial markets, institutions, and regulatory environments, which can positively impact financial reporting quality.

- Attraction of foreign investment: A highly educated population, as demonstrated by secondary high school enrollment rates, can attract foreign investors who view the country as having strong human capital and a skilled labor force. To maintain investor confidence, nations are incentivized to improve their financial reporting practices and ensure financial reporting transparency.

7. Foreign Direct Investment (FDI), and trade openness can be considered indirect proxies for high financial reporting quality:

- FDI and regulatory environment: Foreign direct investment can aid in the enhancement of a nation's regulatory framework, as foreign investors frequently demand greater levels of transparency, integrity, and corporate governance. This can contribute to the development and administration of more stringent accounting standards and auditing procedures, which aid in enhancing the quality of reporting.

- Trade openness and competition: Greater trade openness exposes domestic firms to international competition, which may motivate them to enhance their financial reporting practices in order to attract global investors and maintain a

market advantage. This contest can assist in enhancing the content of reporting.

Pivot comparison table

Since the data analysis will be done on the basis of the R-studio program, it is necessary to give each indicator the value of the corresponding variable. The final table of variables (Table 4) is represented by the corresponding code:

«tabledata <- data.frame(mydata)

View(tabledata)

variable_A <- tabledata$Foreign_direct_investment

variable_B <- tabledata$Economic_development

variable_C <- tabledata$Education

variable_D <- tabledata$Trade_Openness

variable_E <- tabledata$XBRL

variable_F <- tabledata$Institutional_Quality

variable_G <- tabledata$Financial_reporting_quality

variable_H <- tabledata$Control_of_Corruption

variable_I <- tabledata$Government_Effectiveness

variable_J <- tabledata$Political_Stability_and_Absence_of_Violence.Terrorism

variable_K <- tabledata$Regulatory_Quality

variable_L <- tabledata$Rule_of_Law_Percentile_Rank

variable_M <- tabledata$Voice_and_Accountability_Percentile_Rank».

Foreign direct investment	Variable A
Economic development	Variable B
Education	Variable C
Trade Openness	Variable D
XBRL	Variable E
Institutional Quality (Accounting globalization)	Variable F
Financial reporting quality	Variable G
Control of Corruption	Variable H
Government Effectiveness	Variable I
Political Stability and Absence of Violence/Terrorism	Variable J
Regulatory Quality	Variable K
Rule of Law Percentile Rank	Variable L
Voice and Accountability	Variable M

Table 5. Variables for analysis

Variables	Mean (average)	25th (developing countries)	Median	75th (developed countries)	Kazakhstan
Financial reporting quality	4.570	4.480	4.570	4.810	**4,81**
XBRL	0	0	0	1	**0**
Accounting globalization	1.672	1.500	2.000	2.000	**0,753**
Institutional Quality	48,43	34,61	55,76	78,67	**74,03**
Economic development	18497.8	2826.3	9103.0	23497.8	**9,009**
Education	74.56	35.84	94.47	106.29	**112.9**
Foreign direct investment	4.244	1.238	2.401	4.124	**2,30**
Trade Openness	90.37	55.34	76.00	108.68	**57,5**

Table 6. Pivot comparison table

The table presents summary data for the selected countries, as well as data for Kazakhstan in a separate column. The table shows the mean, median value, as well as the values of 1 and 3 quartiles.

Results

Results overview

The following will be a brief analysis on the data obtained. The quality of financial reporting is the first variable to assess the impact of the format on the country's financial system. Kazakhstan's score is 4.81, which is 0.022 below the global average and 0.013 above the median value. This is a relatively good score, given that Kazakhstan belongs to the group of emerging economies. As we can see, most of the countries in the sample have not yet implemented the format or are in the process of implementing XRBL. Next are two indicators for XBRL. The first indicator determines whether the XRBL format is accepted at the state level. If yes - 1 point is given, if no - 0 points, Kazakhstan including. The second indicator evaluates the experience of using the standard in the number of years. The indicator is evaluated on the basis of adoption of IFRS and ISA. If both standards are adopted - you are awarded 2 points. If only one standard is adopted - 1 point is assigned. If both standards are not adopted - 0 points. In this case, in Kazakhstan, both standards are partially adopted, so here we give 1 point. Countries with developed economies get 2 points, which also explains the high score in the first indicator. Indicator Institutional Quality is a value of composite index of six World Governance indicators calculated on the basis of Principal component analysis. Here we can see that Kazakhstan's indicator is significantly higher than the average for the sample, but also significantly lower than the indicators of the top countries. Assessment of economic development based on gross national product per capita. Since the comparison is for the end of 2022, we have 9009 dollars per capita, which is 466 dollars less than the average, and 13% less than the countries in the third quartile. The next indicator assessing the level of education shows a high indicator in Kazakhstan - 22.3% above the third quartile and 51.2% above the average value.

The next indicator is calculated as the share of foreign direct investment in gross national product. Here Kazakhstan's indicators are significantly inferior to those of other countries. The last indicator, evaluating openness to trade, is calculated from the share of the sum of exports and imports of the country to GDP. Kazakhstan's score is almost identical to the first quartile at 57.5%. We are not assessing Kazakhstan's overall economic condition in this paper. However, we can see from the data that most of the indicators lag significantly behind developing countries.

As stated above, the dependent variable is the quality of financial reporting, variable G. Further, in order to assess the influence of independent variables, as well as to determine the possible effect

of multicollinearity, a correlation matrix (Figure 4) will be constructed with the following code: «variables <- data.frame (variable_A, variable_B, variable_C, variable_D, variable_E, variable_F, variable_G, variable_H ,variable_I, variable_J, variable_K ,variable_L , variable_M)

```
correlation_matrix <- cor(variables)
print(correlation_matrix)
View(correlation_matrix <- cor(variables))».
```


Figure 4. Correlation matrix

Based on the data obtained in the correlation matrix, it is possible to exclude the multicollinearity factor. However, in order to exclude unnecessary indicators that may interfere with the evaluation and drawing of conclusions, it is necessary to include regression analysis.

However, in order to exclude unnecessary indicators that may interfere with the evaluation and drawing of conclusions, it is necessary to include regression analysis. A multiple linear regression is constructed by the following code:

«multiple_regression_model <- lm(variable_G ~ variable_B + variable_A+ variable_C+variable_D+variable_A+variable_E+variable_F+variable_H+variable_I+variable_J+variable_K+variable_L+variable_M)

summary(multiple_regression_model)

Residual standard error: 0.3118 on 76 degrees of freedom

Multiple R-squared: 0.5667, Adjusted R-squared: 0.46702

p-value: 0.0987».

The residual standard error: 0.3118 at 76 degrees of freedom is the root mean square error (RMSE) of the model. This measurement shows how much the residuals (the difference between the actual and predicted values) deviate from the regression line. The smaller the value, the better the model fits the data. Multiple R-squared: 0.5667 is the R^2 coefficient of determination, which shows how much of the variability of the dependent variable is explained by the model. The value of R^2 can range from 0 to 1, where 1 means that the model explains 100% of the variability of the dependent variable. In this case, the R^2 is 0.5667, which means that the model explains approximately 56.67% of the variability of the dependent variable. Adjusted R-squared: 0.46702 is the adjusted R^2 coefficient of determination, which takes into account the number of independent variables in the model and sample size. Unlike the regular R^2, the adjusted R^2 may decrease if the addition of minor variables does not improve the model. In this case, the adjusted R^2 is 0.46702, which means that the model explains about 46.70% of the variability of the dependent variable given the number of independent variables and sample size. The p value: 0.0987 is the overall p value associated with the F-statistics of the model. It is used to test the null hypothesis that all regression coefficients are zero (i.e. there is no relationship between the dependent variable and any of the independent variables). If the p-value is less than the chosen significance level (usually 0.05), we can reject the null hypothesis and conclude that at least one of the independent variables has a significant effect on the dependent variable. In this case the p-value is 0.0987, which is higher than the usual 0.05 threshold, and we cannot reject the null hypothesis. The residual standard error: 0.3118 at 76 degrees of freedom is the root

mean square error (RMSE) of the model. This measurement shows how much the residuals (the difference between the actual and predicted values) deviate from the regression line. The smaller the value, the better the model fits the data. Multiple R-squared: 0.5667 is the R^2 coefficient of determination, which shows how much of the variability of the dependent variable is explained by the model. The value of R^2 can range from 0 to 1, where 1 means that the model explains 100% of the variability of the dependent variable. In this case, the R^2 is 0.5667, which means that the model explains approximately 56.67% of the variability of the dependent variable. Adjusted R-squared: 0.46702 is the adjusted R^2 coefficient of determination, which takes into account the number of independent variables in the model and sample size. Unlike the regular R^2, the adjusted R^2 may decrease if the addition of minor variables does not improve the model. In this case, the adjusted R^2 is 0.46702, which means that the model explains about 46.70% of the variability of the dependent variable given the number of independent variables and sample size. The p value: 0.0987 is the overall p value associated with the F-statistics of the model. It is used to test the null hypothesis that all regression coefficients are zero (i.e. there is no relationship between the dependent variable and any of the independent variables). If the p-value is less than the chosen significance level (usually 0.05), we can reject the null hypothesis and conclude that at least one of the independent variables has a significant effect on the dependent variable. In this case the p-value is 0.0987, which is higher than the usual 0.05 threshold, and we cannot reject the null hypothesis. Thus, the variables that negatively affect the significance of the model are removed from the formula. The following model is constructed:

«multiple_regression_model <- lm(variable_G ~ variable_B + variable_A+ variable_C+variable_D+variable_A+variable_E+variable_F)

summary(multiple_regression_model)

Residual standard error: 0.231 on 72 degrees of freedom

Multiple R-squared: 0.7667,   Adjusted R-squared: 0.7369

p-value: 0.0487».

The results are much better. The model is described by 76.67%. The null hypothesis is rejected (Figure 5).
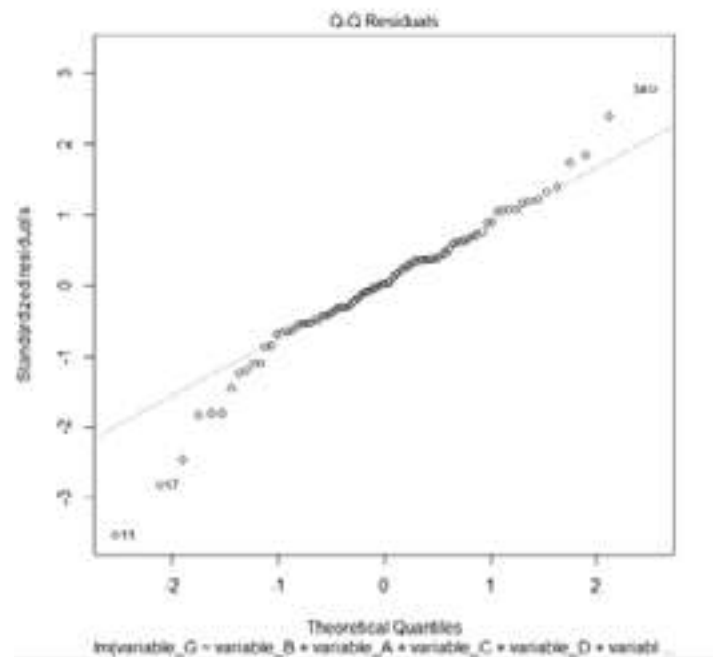
Figure 5. Multiple regression model

Segmented analysis

Next, for a more detailed assessment of economic indicators, we analyzed two countries that implemented the XBRL format at the same time in 2002. Based on the data, a time series model was built using data from 1988 to 2021. The time periods of both countries are divided into two segments: before and after the implementation of XBRL. Since, according to the regression analysis, we see the greatest relationship between high financial reporting and variables denoting the level of investment and exports and imports into the country, we will focus on looking at these indicators (Figure 6 and Figure 7). To visualize the analysis, the following code was introduced:

```
split_year <- 2002
data_before <- data[data$year < split_year, ]
data_after <- data[data$year >= split_year, ]
model_before <- lm(value ~ year, data = data_before)
model_after <- lm(value ~ year, data = data_after)
ggplot(data, aes(x = year, y = value)) +
  geom_point() +
  geom_smooth(data = data_before, method = "lm", se = FALSE, linetype = "solid", color = "blue") +
  geom_smooth(data = data_after, method = "lm", se = FALSE, linetype = "solid", color = "red") +
  ggtitle("Segmented Time Series Analysis Italy")
```
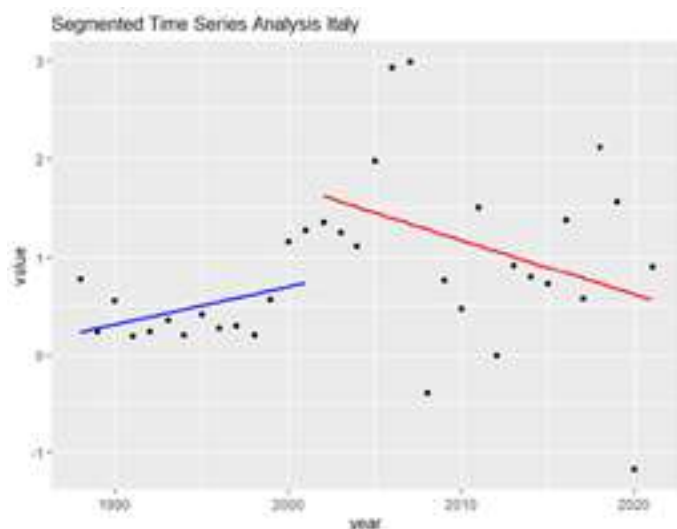
Figure 6. Segmented time series analysis - Italy
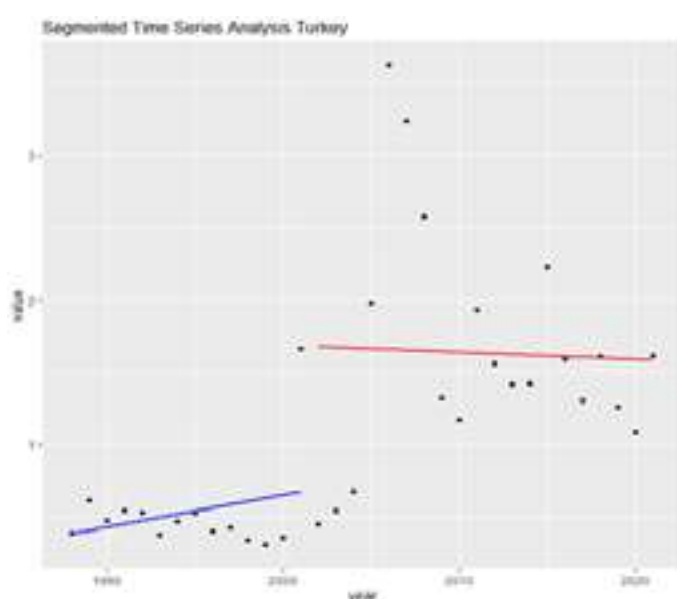
Figure 7. Segmented time series analysis - Turkey

According to these graphs, we can assume a positive impact of the introduction of the XBRL format, which in turn is closely related to the quality of financial reporting, as already defined above.

Suggestions for XBRL implementation

Globally, the concept of digital transformation is proliferating. In modern civilization, digital technologies play an increasingly important role in the growth of national economies. They provide numerous benefits, such as easier access for individuals and businesses to government services, faster information exchange, opportunities for business innovation, the development of new digital products, and so on. Kazakhstan's government and government agencies recognize the importance of informatization of society and the development of digital technology for long-term economic growth, and they actively participate in the development of this field, integrating it into key areas of government policy.

The state initiative "Information Kazakhstan 2020," which was approved in 2013, served as the foundation for the digital transformation of Kazakhstan's economy. The program contributed to the growth of the information society, the enhancement of public administration, the establishment of an "open and mobile government," and the expansion of corporate and citizen access to the information infrastructure. Table 7 presents possible problems that the National Bank may encounter when implementing the XBRL format (Basoglu & White 2015).

Potential problem	Suggested solution
Lack of methodology specialists with experience with XBRL.	Conducting training of employees of the National Bank of the Republic of Kazakhstan. Creation of advisory centers and supervisory bodies.
Lack of regulatory framework for the use of XBRL in the National Bank of the Republic of Kazakhstan and other companies.	Approved developments governing the process of creating elaborated instructions and manuals, developed in conjunction with external consultants, as well as having undergone the evaluation procedures of independent experts.
Insufficient number or lack of IT specialists to support and implement technical processes to implement XBRL.	Development and support of software for the conversion of financial reporting data in the XBRL format, creating conditions for training specialists.

Table 7. Potential difficulties of XBRL implementation

It is crucial to consider international experience for the successful implementation of XBRL in Kazakhstan's economic environment. In this context, it is important to note the European Single Electronic Format (ESEF) initiative, which was developed in accordance with the European Securities and Markets Supervisory

Service's identical requirements. It is intended to implement this singular format beginning in 2020. As part of this initiative, Fujitsu proposed the RAPORTADO unified software package, which takes into account the requirements of both regulators (including tools for working with taxonomies, developing filling templates, validation rules, etc.) and supervised organizations (automatic generation of web forms, conversion of Excel files). In addition, the Committee on Statistics of the European Central Bank (ECB) has established a special group dubbed GRISS (Group de Reflexion on the Integration of Statistical and Supervisory Data) for the integration of statistical and supervisory data. This group is engaged in the formulation of recommendations and a plan of action for this area (FUJITSU Software Interstage XWand, n.d.). Despite the foreign companies' extensive experience in reporting using the extensible language XBRL, its implementation remains a matter of debate:

• First, the use of the XBRL format makes sense and is warranted for organizations whose securities are traded on stock exchanges and whose reporting must comply with International Financial Reporting Standards (IFRS). The financial statements in XBRL format are advantageous because they give foreign investors access to this information without incurring additional labor and financial costs.

• The possibility of producing financial statements in other formats (text or physical copy) is not excluded, even though XBRL-formatted statements are in high demand among users. This suggests that the overall cost of reporting may increase.

• Thirdly, the implementation of XBRL format cannot completely eliminate errors in financial statements; however, the automatic comparison of financial statement indicators in XBRL language helps to reduce errors (Bank of Russia: Bulletin of XBRL: Issue #2 (11), n.d.).

Foreign practice shows that the implementation of the XBRL language in the preparation of financial statements can be based on different approaches. Option 1: Requires mandating all organizations, financial and non-financial, to prepare their financial statements in XBRL format. This requires the formulation and implementation of uniform requirements for the composition, structure, completeness, and frequency of reporting, as well as a substantial investment for the implementation of the project and the availability of qualified personnel. Additionally, the government should actively support the implementation of XBRL, including financing the associated work (Romanova et al., 2021). Option 2: A voluntary XBRL financial reporting system is the second option. It would apply to organizations with foreign capital that must report in this format. It would also apply to companies seeking foreign investment and stock exchange listings (Romanova et al., 2021). Option 3: The third approach is based on the principle of a gradual introduction of XBRL, beginning with a requirement that certain organizations, such as those required to report under IFRS, prepare financial statements in XBRL. This practice may then be implemented by additional organizations. This strategy reduces the cost of locating and compensating specialists with the necessary knowledge and skills, as well as the cost of utilizing the accumulated experience and knowledge to further disseminate XBRL, resulting in financial investment savings (Romanova et al., 2021). In the CIS economic space, an example of successful implementation of the XBRL format can be seen in Russia. Based on the analysis of the main processes of format implementation in Russia, an approximate action plan for the management of the National Bank of the Republic of Kazakhstan on the implementation of the format was made (Table 8) (Bank of Russia, 2022). The plan consists of three main areas: administrative, methodological and technological.

Administrative track	
Implementation period	**Key actions**
1-2 months	Approval of the National Bank of the Republic of Kazakhstan to implement the XBRL project.
1 month	Entry of the National Bank of the Republic of Kazakhstan into the XBRL International Association.
up to 3 months	Creation of a Working Group for the implementation of the project, which should include both financial market participants and executive bodies.
up to 12 months	Formation and transfer of test financial reports in XBRL format to the National Bank, followed by analysis and evaluation of the results.
up to 12 months	Establishment of a permanent XBRL jurisdiction to develop and support the implementation of the format.
12 to 24 months	Selecting some financial market participants to start collecting and processing financial statements in XBRL format, for example, we can start with: 1) Insurance companies; 2) JSC "Single accumulative pension fund"; 3) Securities market participants.
Methodological track	
Implementation period	**Key actions**
5-6 months	Development and publication of the basic XBRL taxonomy of the National Bank of the Republic of Kazakhstan with subsequent testing.
5-6 months	Development and publication of the extended XBRL taxonomy of the National Bank of the Republic of Kazakhstan with subsequent testing.
up to 12 months	Development and publication of the final version of the XBRL taxonomy of the National Bank of the Republic of Kazakhstan with subsequent testing.
up to 12 months	Development of normative legal acts regulating the requirements for the preparation and submission of reports, taking into account the peculiarities of the taxonomy.
Technological track	
Implementation period	**Key actions**
up to 12 months	Participation in the development and additions to the XBRL taxonomy.
12 to 24 months	Development of certification software necessary to perform conversion of data into XBRL format.
Up to 5-6 months	Organization of a support center for companies, on consultations in the preparation and processing of financial statements in the new format.
12 to 24 months	Preparation and publication of guides and manuals on open portals, as well as translation of foreign literature on XBRL reporting.
Up to 12 months	Launch and support of a course on XBRL technology on the basis of universities that train specialists primarily in "Finance", "Accounting and Auditing", "Information Technology".

Table 8. The XBRL Implementation Action Plan

Limitations

This research has a number of drawbacks. Initially, limited country focus: although the literature review includes studies from various countries, it cannot provide a complete picture of the adoption of XBRL and its impact on financial reporting quality worldwide. As a result, the findings may not be generalizable to all countries and regions. Secondly, lack of recent sources: Some of the sources cited in the literature review are relatively old (e.g., Watson and Hoffman, 2003), which may limit the relevance and relevance of the information presented. Thirdly, insufficient research on problems and obstacles: While the literature review mentions some of the challenges of implementing XBRL, it does not provide an in-depth analysis of the potential barriers and difficulties organizations may face in the implementation process, such as resistance to change, lack of experience, or regulatory issues. There is also a potential bias toward the positive effects of XBRL: a review of the literature appears to emphasize the benefits and positives of implementing XBRL, which could lead to a reassessment of its impact on financial reporting quality. It is important to maintain a balanced perspective by also examining the potential disadvantages or unintended consequences of implementing XBRL. It's best to resort to an in-depth numerical assessment later on.

Further recommendations

In a further study, it is possible to disclose in more detail data on the top 10 countries that have already implemented this format. Conduct an analysis for multicollinearity for the selected indicators. And also, based on the regression equation, make a forecast for improving the assessment of the quality of financial reporting for Kazakhstan in the event that the XBRL standard is adopted.

Conclusion

In conclusion, this thesis has conducted a thorough examination of the International Financial Reporting Standard XBRL and its potential adoption and implementation in Kazakhstan. Utilizing numerous analytic techniques, such as SWOT, PEST, the BCG matrix, and Porter's Five Forces, the study has systematically examined the benefits and drawbacks of incorporating the XBRL format. In addition, the thesis provides a comparative analysis of important economic indicators between countries currently using the XBRL format and those who have not yet adopted it. The findings of this study firmly suggest that the development and implementation of the XBRL format in Kazakhstan would be beneficial and advantageous to the economic growth of the country. The SWOT analysis has revealed a number of significant strengths and opportunities associated with Kazakhstan's adoption of the XBRL format. Enhanced financial information efficiency, transparency, and comparability would not only improve the investment climate but also strengthen the nation's financial market. In addition, enterprises would be able to operate more efficiently, contributing to the expansion of the Kazakhstani economy as a whole. To ensure the successful implementation of the XBRL format, it is essential to address and mitigate obstacles such as the need for training and education, technological infrastructure, and regulatory enforcement. The PEST analysis has shed light on the political, economic, social, and technological factors influencing Kazakhstan's adoption of the XBRL format. Economic incentives for businesses to adopt the XBRL format are essential, as is political support for the implementation of international financial reporting standards. In addition, fostering a culture of financial transparency and literacy is crucial to the successful implementation of XBRL. Lastly, investments in the creation and incorporation of technological infrastructure are crucial for the pervasive adoption of XBRL. The BCG matrix has categorized the potential adoption of the XBRL format in Kazakhstan as a "star" initiative, indicating high growth and market share prospects, which would result in long-term benefits for the country. Kazakhstan has the opportunity to establish itself as a regional leader in financial reporting by adopting the XBRL format, thereby attracting more foreign investment and nurturing sustainable economic growth. The competitive landscape of XBRL adoption in Kazakhstan was depicted using Porter's Five Forces model. It is estimated that the threat of new entrants and the bargaining power of suppliers are comparatively low, whereas the bargaining power of buyers, the threat of substitute products, and competitive rivalry are moderate. These conditions suggest that the Kazakhstani market is well-positioned for the adoption and implementation of

the XBRL format, which would enhance the country's global financial competitiveness. The comparative analysis of key economic indicators between nations using the XBRL format and nations that have not adopted it has highlighted the advantages of adopting the format. Notably, countries that have implemented XBRL tend to experience increased financial transparency, an increase in foreign investment, and a rise in economic growth. This strengthens the case for Kazakhstan to implement the XBRL format. The evidence presented in this thesis strongly supports Kazakhstan's adoption and implementation of the International Financial Reporting Standard XBRL. The prospective benefits of adopting the XBRL format, which include increased efficiency, transparency, and comparability of financial information, as well as the prospects for economic growth and the attraction of foreign investment, outweigh the associated challenges and risks. By addressing these challenges and capitalizing on these opportunities, Kazakhstan will be able to successfully implement the XBRL format, securing the nation's economic future.

Bibliography
1. Robinson, T. R. (2020). International financial statement analysis. John Wiley & Sons.
2. Pinsker, R., & Li, S. (2008). Costs and benefits of XBRL adoption. Communications of the ACM, 51(3), 47-50. https://doi.org/10.1145/1325555.1325565
3. Cox, C. (2006). The Promise of Interactive Data. Paper presented at the 14th International XBRL Conference, Philadelphia, PA.
4. Debreceny, R., & Gray, G. L. (2001). The production and use of semantically rich accounting reports on the Internet: XML and XBRL. International Journal of Accounting Information Systems, 2(1), 47-74 http://dx.doi.org/10.1016/S1467-0895(00)00012-9
5. Beattie, V., & Pratt, K. (2003). Issues Concerning Web-based Business Reporting: An Analysis of the Views of Interested Parties. British Accounting Review, 35(2), 155-187. https://doi.org/10.1016/S2212-5671(15)01160-0
6. Weverka, P., & So, W. S. (2008). XBRL for Dummies. Wiley Publishing.
7. Boritz, J. E., & Timoshenko, L. M. (2015). Firm-Specific Characteristics of the Participants in the SEC's XBRL Voluntary Filing Program. Journal of Information Systems, 29(1), 9-36. https://doi.org/10.4192/1577-8517-v16_4
8. Efendi, J., Park, J. D., & Smith, L. M. (2014). Do XBRL filings enhance informational efficiency? Early evidence from post-earnings announcement drift. Journal of Business Research, 67(6), 1099-1105. https://doi.org/10.1016/j.jbusres.2013.05.051
9. Debreceny, R. S., Farewell, S. M., Piechocki, M., Felden, C., Graning, A., & D'eri, A. (2011). Flex or break? Extensions in XBRL disclosures to the SEC. Accounting Horizons, 25(4), 631-657. https://doi.org/10.5296/ijafr.v3i2.3870
10. Valentinetti, D., & Rea, M. A. (2011). Adopting XBRL in Italy: Early Evidence of Fit Between Italian GAAP Taxonomy and Current Reporting Practices of Non-listed Companies. The International Journal of Digital Accounting Research, 11(3), 45-67. https://doi.org/10.4192/1577-8517-v11_3
11. Adams, C., & Frost, G. (2004). The Development of Corporate Web-sites and Implications for Ethical, Social and Environmental Reporting through these Media. ICAS Research Monograph. Edinburgh: Institute of Chartered Accountants of Scotland.
12. Watson, L., & Hoffman, C. (2003). XBRL: The New Language of Business Reporting. John Wiley & Sons.
13. Hicks, R. A., & Williams, S. M. (2011). The impact of XBRL on financial reporting. Journal of Accountancy, 211(1), 32-38.
14. Leuz, C., Libby, R., & Wysocki, P. (2008). XBRL and financial analysis. Journal of Accounting Research, 46(5), 917-961. https://doi.org/10.1007/s11142-013-9273-4
15. Bolgiano, M., Pryde, C., & Botos, A. B. (2009). XBRL implementation handbook. John Wiley & Sons.
16. Cheng, Q., Lin, Y. C., & Xu, X. (2016). XBRL and financial reporting quality: Evidence from China. Journal of International Accounting Research, 15(2), 1-19. https://doi.org/10.18111/9789284419029
17. Tawiah, R., & Borgi, J. (2018). Impact of XBRL adoption on financial reporting quality: A global evidence. Journal of Applied Accounting Research, 19(2), 246-265. https://doi.org/10.1108/ARJ-01-2022-0002
18. Romanova, Kulikova, & Izmalkova. (2021). Components of Financial Statements in Accordance with IAS 1 Presentation of Financial Statements. TRENDS IN SCIENCE AND EDUCATION, 78(4), 62-65. https://doi.org/10.18411/trnio-10-2021-146
19. Bank of Russia's Project on Implementation of XBRL for Non-Financial Institutions | Bank of Russia. (2022, February 11). Bank of Russia Project on Implementation of XBRL for NFEs | Bank of Russia. https://www.cbr.ru/projects_xbrl/project_xbrl_nfo/
20. FUJITSU Software Interstage XWand. (n.d.). Fujitsu Global. https://www.fujitsu.com/global/products/software/middleware/application-infrastructure/interstage/solutions/xbrl/
21. Basoglu, K. A., & White, C. E. S. (2015, August 1). Inline XBRL versus XBRL for SEC Reporting. Journal of Emerging Technologies in Accounting, 12(1), 189–199. https://doi.org/10.2308/jeta-51254

The Effects of Monetary Policy on Inflation in Kazakhstan

Duisenbayev Duman, Kubessov Dinmukhamed, Mamirova Aruna, Seitkassymova Milana, Slanbekova Guldana

Abstract

This study examines the impact of monetary policy on inflation in Kazakhstan. To evaluate the model, annual data for 2013-2022 were used. The study was limited to these variables, the interest rate, the exchange rate, and the money supply versus inflation. In the research, we used the FDL multiple linear regression model with time series data. The main variables of the model, which is used by the national bank to control inflation, are the discount rate, money supply, and exchange rate. Also, to achieve correct results, the model has been improved by "lag," i.e., to figure out which subsequent periods are affected by the discount rate increase. The results of our study showed that to reduce the growth of inflation, an increase in the interest rate and a decrease in the money supply is followed by a decline in the inflation rate in the next quarter, but the exchange rate does not have a significant impact on the inflation rate. Economic and geopolitical shocks also have a substantial impact on inflation. Therefore, in our study, it is recommended to use not only monetary policy to control inflation but it is also needed to use fiscal and other non-monetary measures.

1. Introduction

Today, inflation is one of the most discussed economic terms in the media and public. Like Lekachman (1973), many economists have used different definitions of inflation, but there is a common theme. Inflation is usually defined as a continuing or sustained upward trend in the overall price level. According to economists similar to Friedman (1963), inflation is the result of the state's monetary policy, represented by the regulator.

It is widely believed in the economic community that monetary policy, by controlling the money supply in the economy and influencing interest rates, can help maintain price stability, creating an enabling environment for sustained economic growth. Numerous detrimental effects of inflation include reduced purchase power of money, which might result in a drop in living standards for those on fixed incomes or with savings. Due to inflation, prices for products and services may grow quicker than the earnings of the most disadvantaged people, resulting in an unfair distribution of wealth and income among different demographic groups. A worsening of the economy and a rise in uncertainty are caused by unanchored inflation expectations, which can result in unstable prices for goods and services and make it challenging for businesses to plan and invest.

Monetary policy in Kazakhstan is aimed at curbing inflation, which has a significant impact on the economy. The National Bank of Kazakhstan implements monetary policy through various instruments, such as adjusting the required reserves for commercial banks, setting a discount rate for loans to commercial banks, or engaging in open market operations to buy or sell government securities. The specific goal of monetary policy may vary depending on the economic and financial conditions of the country. Still, its overarching goal is to maintain price stability, full employment, and economic growth.

Inflation is a word that is common in everyday life. Everyone describes inflation in their way; Amadeo (2012) cited it as when the prices of most goods and services continue to creep upward, leading to a low standard of living (p.10). Due to inflation, there is uncertainty and difficulty in predicting the relative prices of goods and services, which forms an obstacle to making financial decisions in everyday life. Most people strongly dislike high and variable inflation, which causes many economic distortions (Agarwal & Kimball, 2022, p.123). According to information taken from the official website of the NBK (www.nationalbank.kz), inflation can be caused by various factors, both internal and external. Internal factors include the velocity of money in the economy, the output gap, inflationary expectations of the population, labour productivity, the level of employment, competition in the markets, and the per capita income. External factors affecting inflation are prices on world commodity markets, exchange rates, international trade relations, and other economic events. The Consumer Price Index (CPI) is the most widely used measure of inflation. CPI is a consumer basket of goods and services, thus measuring the average

cost of living. The percentage change in the CPI over a given period is consumer price inflation.

2. Literature review

Inflation often leads to a rise in poverty from loss of purchasing power (Cardoso, 1992). This leads to social tensions and high inflationary expectations, as it causes many economic distortions and uncertainties. The study of inflation and monetary policy is essential for economic analysis, and Kazakhstan is no exception. This literature review will look at existing articles and studies on this topic, focusing on Kazakhstan.

One of the critical conclusions of the article by Kadirbekov and Kazieva is that inflation is a multifactorial problem, and its solution requires a comprehensive approach (Kadirbekov & Kazieva, 2019). This article considers the main factors influencing inflation in Kazakhstan and proposes a strategy to combat inflation. According to the authors, one of the leading causes of high inflation is a weak link between monetary policy and the real sector of the economy.

The main idea of Mukhamediev's article (Mukhamediev, 2018) is that price stability and inflation persistence in the economy of Kazakhstan directly depend on organized monetary policy and the balance between fiscal and budgetary policies. The author also points out the importance of money supply management and price control of goods and services in the economy. It analyses how fiscal policy can play a role in controlling inflation.

Nargoziev (2007) provides an overview of the world's experience in regulating inflation and inflation expectations, including the experience of developed countries such as the USA, EU, and Japan and the experience of developing countries such as Brazil, Mexico, and India. Special attention is paid to the experience of Central Asian countries, including Kazakhstan. According to the article, Kazakhstan has pursued several initiatives to control inflation in Central Asia, including adopting inflation targeting, enhancing fiscal restraint, and conducting structural reforms. The efficacy of these efforts in recent years in keeping Kazakhstan's inflation rate low is highlighted in the article. Overall, the paper offers a helpful summary of international techniques for controlling inflation and emphasizes the significance of controlling inflation expectations.

Key factors such as central bank independence, transparency policy, monetary instruments, and sustainable fiscal policy are the foundations for confidence in the monetary policy conducted (Bems et al., 2021). The main conclusion is that an integrated approach, which should include monetary policy and fiscal, monetary, and structural policies, must be used to manage inflation effectively. It is also necessary to consider the peculiarities of Kazakhstan's economy and the international experience in regulating inflation. When administrating strategies to control inflation, it is vital to consider the unique characteristics of the Kazakhstan economy. For instance, its material reliance on commodity exports, particularly oil, and the extent to which the financial system laboriously dollarized. Additionally, the nation confronts considerable external shocks and has a high level of economic openness, which can affect inflation.

Thus, scientific research shows that monetary policy plays an essential role in combating inflation in Kazakhstan, but it is necessary to consider various factors and features of the national economy in its implementation.

2.1 Conceptual Framework

The money supply, inflation, and monetary policy are closely related. The money supply is the sum of money in the economy. Altogether, the monetary policy is a set of measures. The central bank takes to manage the money supply and inflation. The central bank, "the Bank's Bank," uses numerous appliances to collect the money supply and inflation. For instance, it can affect interest rates through its discount rate, reserve requirements, and mind-open market operations.

Inflation can increase if the money supply is prospering than the accurate volume of consumption in the economy. Given this, the central bank may react to reduce the money supply, such as by uplifting interest rates. If the money supply grows more slowly than the natural volume of goods and services, then this can lead to deflation or low inflation. In the case that the central bank may take a move to display the money supply, such as dropping interest rates. However, in practice, the effectiveness of a monetary policy depends on a variety of factors, including the state of the economy,

the behaviour of households and businesses, and various external shocks, such as a sudden increase in world commodity prices.

2.2 Theoretical Framework

Inflation has always been the subject of in-depth research for economists, with different schools interpreting inflation differently. For a long time studying this process, many theories and guesses voiced that tried to explain the factors that strongly influence the inflation process— several main provisions related to the primary factors performed in several schools of thought.

For example, adherents of monetarism believe that central banks' main task should be to maintain stable money supply growth and not to keep specific interest rates or various economic indicators. One of the scientific works on monetarism is the book "Monetary History of the United States" (Friedman & Schwartz, 1963). This book is in particular because the authors consider the history of money in the example of the United States and how specific processes affected the country's economy. For instance, the book indicates that the money supply changed crucially in the late 90s and early 00s. Due to this, inflation increased. Another important aspect of this school of thought is the concept of the velocity of money circulation - the average number of revolutions made by a monetary unit during the year. Monetarists say that changes in the speed of money circulation are less significant than changes in money in the economy (Friedman, 1956).

The quantitative theory of money. This theory forms on the fact that there is a direct and proportional relationship between the money supply and the price level, with the obligatory condition that other factors will remain unchanged. According to this theory, a unique equation defines these statements: $M * V = P * Y$, where

- M is the money supply.
- V is the velocity of money circulation.
- P is the price level.
- Y is the level of actual output.

This equation demonstrates the same connection when, with an increase in the money supply, the price level or the production volume will increase, depending on the speed of response.

Keynesian theory. Another macroeconomic theory indicates state intervention's high role in the country's economy. According to the votary of this theory, this is necessary to maintain the country's economy in a stable state. It is leading to long-term economic growth. One of this theory's central ideas is that aggregate demand plays a significant role in determining the level of economic activity. Keynes proclaimed that insufficient aggregate demand could inspire prolonged unemployment and low economic growth. By addressing this issue, Keynes advocated for government intervention through fiscal policy, such as increasing government spending or cutting taxes, to stimulate aggregate demand and promote economic growth (Keynes, 1936). In addition to addressing recessions, it is significant to note that the Keynesian approach also offers insights into inflation. According to Keynesian economics, inflation can occur when aggregate demand exceeds the productive capacity of an economy. Keynesians argue that fiscal and monetary measures are transformed to manage and control inflationary pressures in such a situation. By regulating government spending, taxation, and monetary policy, policymakers can direct to strike a balance between stimulating aggregate demand to combat recessions and controlling inflationary pressures within an economy. Keynesian economists suggest that the government can implement contractionary fiscal measures, such as reducing government spending or increasing taxes. Diminish aggregate demand and mitigate inflationary pressures.

Furthermore, the central bank can use monetary tools, such as raising interest rates or tightening the money supply by controlling inflation. The Keynesian method emphasizes the weight by carefully managing twain aggregate demand and inflationary pressures to achieve stable and sustainable economic growth.

2.3 Empirical review

Over the years, the Kazakhstan economy has undergone several changes, and one of the valuable areas that politicians have focused on is inflation. The National Bank of Kazakhstan (nowadays - NBK) is promptly pursuing a monetary policy to maintain a stable inflation rate. This section examines the impact of monetary policy rates on inflation in Kazakhstan. The Central Bank of Kazakhstan used monetary

policy instruments to control the degree of inflation in the country. Several studies have examined the impact of this policy on inflation. Multiple studies have examined the impact of monetary policy on inflation in Kazakhstan. Kalyuzhnova et al. (2016) analyzed quarterly data from 2003 to 2013 and found a significant relationship between inflation and interest rates. They indicated that the monetary policy successfully controlled inflation in the country. Kasymova and Suleimenova (2019) used monthly data from 2001 to 2017 and found that monetary policy rates impact inflation in Kazakhstan. They used a vector autoregressive model (VAR) to calculate the bank rate and stock connection.

Similarly, Esenova and Baymukhanova (2018) used monthly data from 2001 to 2017 and found that monetary policy rates impact inflation in Kazakhstan. They used a structural vector autoregression (SVAR) model to determine the relationship between fiscal policy and diffusion. The study showed that fiscal policy has a limited effect on stock and requires the central bank to adjust bank rates regularly to maintain an inflation balance. Tolegenova et al. (2021) reviewed monetary policy's impact on Kazakhstan's inflation using monthly data from 2008 to 2019. The study found a permanent relationship between monetary policy rates and inflation in Kazakhstan. Additionally, the authors discovered that changes in interest rates have a fascinating impact on inflation. These studies demonstrate a significant connection between monetary policy rates and inflation in Kazakhstan. They also reveal that the Central Bank of Kazakhstan has successfully controlled inflation through its monetary policy measures.

The results also indicate that the central bank needs to continue adjusting interest rates to maintain a stable inflation rate. These findings are important for policymakers in Kazakhstan and can serve as a basis for future monetary policy decisions.

2.4 Overview of Kazakhstan banking sector: National Bank, inflation, strategy 2030

History. The collapse of the Soviet Union in 1991, gaining independence, and the subsequent transition from a planned economy to a market economy - dispersed inflation in Kazakhstan. Until the end of the 1990s, inflation in the country had unpredictable trends. The previously unexplored market economy, involving free pricing, led to a sharp price rise. As a result, at the end of 1992, inflation in Kazakhstan amounted to 2962%. The Kazakhstan government introduced reforms to counteract inflation and stabilize the economic situation. The introduction of its currency, the tenge, in 1993, the low level of foreign exchange reserves, insufficient political stability, and high inflation, which increased the likelihood of massive currency speculation, made it impossible for Kazakhstan to introduce a fixed exchange rate. In this regard, the government of Kazakhstan has taken measures to strengthen tenge while maintaining a freely floating rate. According to Kazbekov (2021), the reasons for ineffectiveness lie in the breakdown of existing markets and value chains within the CIS countries, especially with Russia, and limited access to foreign markets. At the same time, the cost of imports increased, which led to adverse shifts in the current account balance, a decrease in production volumes, a reduction in gold and foreign exchange reserves, and an increase in the country's external and internal debt. Distrust in the new currency, hyperinflation, and general economic instability - led to the depreciation of the tenge, increased inflation expectations, and, as a result, an even more significant increase in inflation. The devaluation of the tenge was so rapid that it limited the ability to use various monetary policy instruments to combat inflation.

As a result, from the second half of 1994, the exchange rate's policy changed from floating too "managed" floating. Between 1995 and 1999, inflation was high but stabilized at about 30%.

In 2000, the period of stabilization of the economy of Kazakhstan began. During this period, inflation decreased from 6% to 10%. In 2007, inflation reached 18.8% due to rising good and energy prices amid the global financial crisis.

From 2008 to 2014, inflation was low and did not exceed 8%. 2015 it increased to 13.6% due to the fall in oil prices and the ruble. In addition, this year, the tenge goes into the so-called "free float", and the NBK switches to the inflation-targeting regime. With the transition to a floating exchange rate, the National Bank keeps inflation within the target corridor by changing the discount rate. Since 2015, the NBK's increased attention to domestic price stability and the emphasis on exchange rate flexibility helped to anchor inflation expectations and absorb external shocks. The National Bank does not intervene in

the exchange rate but can conduct interventions to smooth out market volatility. In 2016, inflation decreased to 8.5%, and in 2017 to 7.1%. In 2018, inflation in Kazakhstan was at the level of 5.3%. In 2019, it decreased to 4.6%, but in 2020 it rose to 7.4%, associated with the COVID-19 pandemic and the global value chains crisis. At the end of 2021, inflation reached 8.4%. The Russian invasion of Ukraine in 2022 affected economic activity in Kazakhstan. Inflation rose to 20.3%, reflecting global inflation and local shocks.

From 2016-2019, the discount rate had a downward trend. In 2020, there was some tightening due to the pandemic. Due to the risks amid the uncertainty of the geopolitical situation, starting from February 2022, the monetary policy tightened in response; the rate rose from 10.25% to 16.75% over the year.

National Bank. Before the creation of the National Bank in 1993, the Central Committee of the Communist Party of Kazakhstan and the Council of Ministers of the Kazakh SSR made decisions on the money supply. In those years, Kazakhstan was part of the Soviet Union, and the national currency - the Kazakh tenge - had not yet been introduced. Central planning was the primary tool for regulating the economy in those years, which determined the prices of goods and services and the money supply.

After Kazakhstan gained independence in 1991, the economic situation in the country began to change, and it became necessary to create new institutions to regulate the economy. As a result, the National Bank - the central bank representing the first level of the banking system, the primary purpose of ensuring price stability in the country – has appeared (NBK Annual Report, 2022). Broadly understood, the tasks of the NBK include:

•Improving the welfare of the population of Kazakhstan through managing economic fluctuations.

•Ensuring low inflation.

•The financial system's stability.

The National Bank of Kazakhstan is engaged in the development and implementation of the monetary policy of the state. The main instrument of this policy is the manipulation of the discount rate. In addition, per the law, it ensures the functioning of payment systems and conducts currency regulation and control. For example, the NBA implements macroprudential policies to maintain the financial system's stability.

This policy aims to reduce the financial sector's systemic risks and minimize the likelihood of a liquidity loss risk for a significant part of financial market participants, i.e., financial crisis. The NBK collects and analyses monetary, financial market, and external sector statistics.

NBK's Monetary Policy Strategy up to 2030. The Strategy seeks to improve the transparency of the NBK's policy to ensure price stability and strengthen the foundations of the inflation-targeting regime in Kazakhstan. Inflation targeting is a monetary policy aimed at controlling the inflation rate by targeting a target value. This approach has been used in Kazakhstan since 2015 when the tenge moved to the so-called free float. As part of this policy, the NBK annually sets inflation targets. For example, by 2023, the target value is 4-5%. Inflation targeting allows investors and businesses to analyse and plan their investment decisions well in advance – increasing the predictability of monetary policy. One of the main difficulties that can be encountered in implementing inflation targeting is the discrepancy between inflation targets and actual economic conditions.

The NBK's Monetary Policy Strategy 2030 defines the main priorities and principles of conducting monetary policy, which will increase public awareness and understanding of the policies of the National Bank. The key initiatives in the Strategy are divided into three areas: 1) strengthening the monetary bases; 2) increasing the efficiency of the financial market; 3) strengthening the macroeconomic policy framework (National Bank of Kazakhstan, 2021).

3. Methodology

3.1 Regression model

In this study, we replicate an econometric model from Ahiabor's paper "The effects of monetary policy on inflation in Ghana" (2013) to identify the relationship between the inflation rate (measured by CPI) and the NBK's monetary policy tools to reduce the inflation rate. Also, this model is the most suitable for our study, since the economy of Ghana is developing and the main part of GDP is agriculture and mining, likewise in Kazakhstan. The key instruments of the National Bank for reducing the inflation rate are:

•   Discount rate which is the interest rate charged to commercial banks (second-tier banks) for the short-term

loans they take from the National Bank.
•Money Supply (M1) which indicates the quantity of money on the market including currency, deposits, and savings.
•Exchange rate. This is not the direct instrument of the National Bank. However, the National Bank can affect the exchange rates by providing currency interventions to control inflation.
In addition, we will be able to predict the value of the dependent variable (CPI Growth) assuming any changes in monetary policy.

The purpose of our study is to determine the dependence of the CPI growth rate on the monetary policy of Kazakhstan using quarterly data for 2013-2022 (40 quarters). The model is as follows:

CPI Growth rate = b0 + b1*Discount rate growth + b2*Exchange rate growth + b3*M1 growth + b4*Discount rate growth lagged_1 + b5*Discount rate growth lagged_2
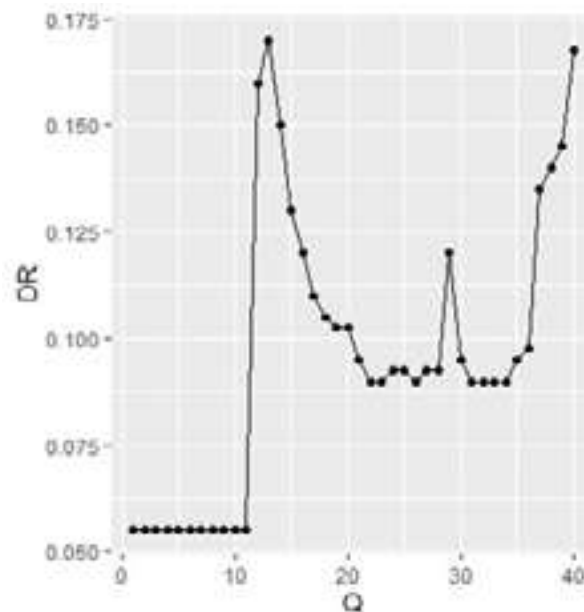
Figure 1 – Discount rate dynamics

The discount rate in Kazakhstan is the main instrument for controlling inflation, therefore, in cases of inflation spikes caused by political shocks, the national bank raises the rate significantly both in 2015 and 2016 after sanctions against Russia and in 2022 due to the war in Ukraine, as it is seen from figure 1
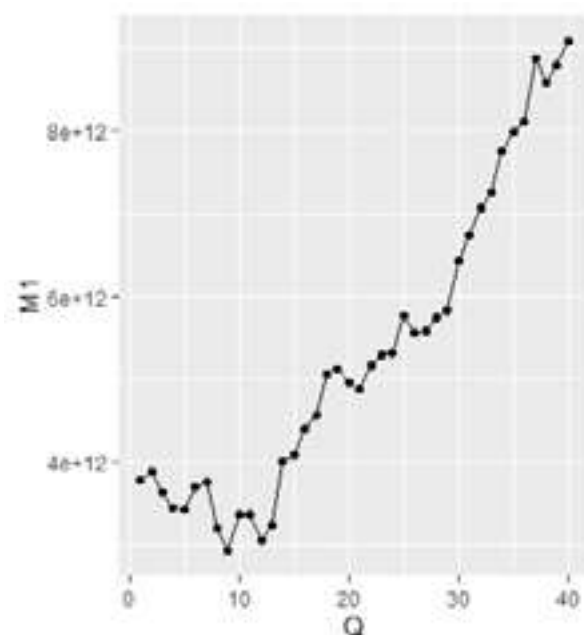
Figure 2 – Money supply dynamics

In Kazakhstan, where inflation is historically high, the money supply has had a positive trend for over 10 years under analysis. When the national bank of Kazakhstan increases the money supply to stimulate the economy, then prices also increase.
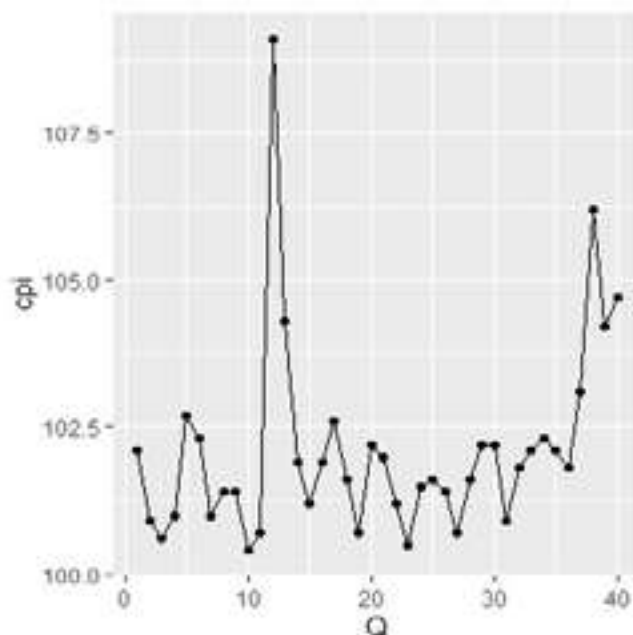
Figure 3 – CPI dynamics

Kazakhstan is a developing economy, where inflation has been high since independence. Political shocks also have a negative impact, such as the sanctions imposed on Russia, which is the main economic partner of Kazakhstan in 2014, and the war in Ukraine, which has been going on for more than a year.

Until 2015, Kazakhstan had a fixed exchange rate, which is typical for countries with developing economies, where the state allocates money from the budget to maintain the exchange rate of the national currency. The maximum exchange rate was observed in February – March 2022 when Russia invaded Ukraine.

To accommodate possible non-instant effects of the change in the discount rate on CPI growth, so we add lagged discount rate growth for one and two years as additional regressors to estimate its effect on current inflation. Thus, our model is the finite distributed lag (FDL) model.

Additionally, we employ all variables in their growth rates to show the effect of the change in the independent variables on the change in our dependent variable.
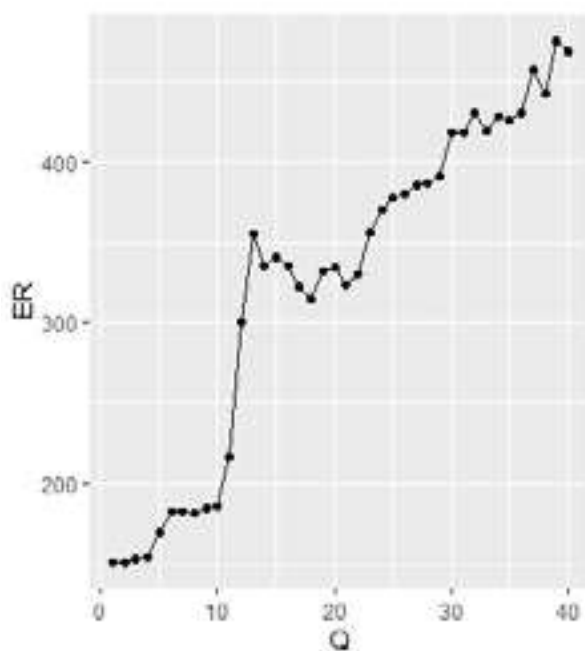
Figure 4 – Exchange rate dynamics

Data on Kazakhstan's M1, discount rate, exchange rate, and CPI were taken from the following sources for the period from Q1 2013 to Q4 2022:
•Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan.
•National Bank of the Republic of Kazakhstan.
•Refinitiv.

3.2 Results

To estimate the effect of monetary policy on inflation, we used the FDL multiple linear regression model with time series data. The National Bank increases the discount rate during periods of high inflation, so the results of the rate increase have an impact on subsequent periods, while in the current period, we expect a positive correlation between CPI and the discount rate (b_1 coefficient). To determine which subsequent periods are affected by the discount rate increase, we used "lag" about the discount rate. The regression showed the following results:

```
========================================
========================================
                      Dependent variable:
                      --------------------------
                            cpi_growth
----------------------------------------
DR_growth                     0.044***
                              (0.009)

ER_growth                      -0.027
                              (0.038)

M1_growth                      -0.038
                              (0.030)

DR_growth_lagged              -0.016***
                              (0.006)

DR_growth_lagged2              -0.009
                              (0.006)

Constant                       0.196
                              (0.207)
```

```
----------------------------------------------
Observations                             37
R2                                    0.736
Adjusted R2                           0.693
Residual Std. Error          1.036 (df = 31)
F Statistic           17.244*** (df = 5; 31)
========================================
========================================
Note:             *p<0.1; **p<0.05; ***p<0.01

= = = = = = = = = = = = = = = = = = = = = = = =
```

It was found that the discount rate growth is highly statistically significant only for the first subsequent quarter. Other variables show insignificant results. The R^2 equals 0.736, which means that 73.6 per cent of the total variation in the dependent variable can be explained by the variation in independent variables. The increase in discount by one percentage point reduces inflation by 0.016 percentage points.

For determining the impact of the exchange rate and money supply on subsequent periods, we conducted an additional regression. The model defined is as follows:

CPI Growth rate = b_1*Discount rate growth + b_2*Exchange rate growth + b_3*M1 growth + b_4*Discount rate growth lagged_1 + b_5*M1 lagged_1 + b_6*Exchange rate lagged_1

This regression shows the following results:

```
========================================
========================================
                        Dependent variable:
                        -------------------------
                              cpi_growth
----------------------------------------------
DR_growth                        0.040***
                                (0.009)

ER_growth                        -0.002
                                (0.042)

M1_growth                        -0.058*
                                (0.031)
```

DR_growth_lagged	-0.018***
	(0.006)
ER_lagged	0.001
	(0.004)
M1_lagged	0.000
	(0.000)
Constant	-0.409
	(0.700)

Observations	38
R2	0.719
Adjusted R2	0.665
Residual Std. Error	1.068 (df = 31)
F Statistic	13.252*** (df = 6; 31)

= =
= =

Note: *p<0.1; **p<0.05; ***p<0.01

= =

This regression shows statistically significant results for the lagged discount rate growth and money supply growth in the current quarter, however, the results for the exchange rate are insignificant in the current and subsequent quarters. Thus, our results do not confirm the effect of the exchange rate on inflation in Kazakhstan. An increase in inflation in the current quarter causes a decrease in the money supply in the current quarter because of the contractionary monetary policy (an increase in the discount rate). This, in turn, decreases inflation slightly in the subsequent quarter. Therefore, our analysis confirms the effect of the monetary policy on inflation one quarter later, though this effect is found to be very modest. The R2 of 0.719 indicates 71.9 per cent of the total variation in the dependent variable is explained by the variation in independent variables.

4.   Conclusion

The impact of the discount rate on inflation in the Republic of Kazakhstan has a delay of one quarter. This means that changes in the discount rate begin to affect the inflation rate only after a certain time. This is probably because monetary policy requires time to implement its impact on the economy. The regression results did not show a significant effect of the exchange rate on the consumer price index. This may indicate that other factors, such as changes in world trade, changes in supply chains, and domestic factors, impact inflation in Kazakhstan more than the exchange rate. Inflation in Kazakhstan is highly dependent on external factors, such as economic and geopolitical shocks. This may mean that changes in the international environment, prices on world markets or political events may have a significant impact on the inflation rate in the country. For a more accurate analysis and forecasting of inflation in Kazakhstan, it may be necessary to consider not only internal factors, such as the discount rate but also external factors, such as the exchange rate and global economic trends. This can help to assess the relationship and predict future changes in the inflation rate in the country more fully and accurately.

References

1.   Agarwal, R., & Miles K. (2022). How Costly Is Inflation? Finance and Development, Analytical Series, 123

2.   Amadeo, K. (2012). Obamacare Bill: A Summary of the Bill's, 10

3.   Bems, R., Caselli, F., Grigoli, F., & Gruss, B. (2021). Expectations' anchoring and inflation persistence. Journal of International Economics, 132, 103516. Retrieved from https://doi.org/10.1016/j.jinteco.2021.103516

4.   Cardoso, E. (1992). Inflation and Poverty. NBER Working Paper 4006, National Bureau of Economic Research, Cambridge, MA. Retrieved from https://www.nber.org/papers/w4006

5.   Esenova, A., & Baymukhanova, K. (2018). The impact of monetary policy on inflation in Kazakhstan. Economic Alternatives, 1, 32-41

6.   Friedman, M. (1963). Inflation: Causes and Consequences. Asia Publishing House, New York

7.   Friedman, M. (1956). The quantity theory of money: A restatement. In Studies in the Quantity Theory of Money (pp. 3-21). University of Chicago Press

8.   Friedman, M., & Schwartz, A. J. (1963). A monetary history of the United States, 1867-1960. Princeton University Press

9. Kadirbekov&Kazieva.(2019)."Inflationary progress: factors, mechanism, and coping strategy." Retrieved from https://cyberleninka.ru/article/n/inflyatsionnyy-progress-faktory-mehanizm-strategiya-preodoleniya

10. Kalyuzhnova, Y., Nygaard, C., & Rolseth, L. (2016). Exchange rates, interest rates, and the inflation rate nexus in Kazakhstan. Journal of Central Banking Theory and Practice, 5(2), 47-68

11. Kasymova, D., & Suleimenova, M. (2019). The impact of monetary policy on inflation in Kazakhstan. Journal of Central Banking Theory and Practice, 8(3), 5-28

12. Kazbekov, B.K. (2021). Anti-inflationary measures of currency regulation: Lessons from "shock therapy" in Kazakhstan in 1993-2000. Retrieved from https://online.zakon.kz/Document/?doc_id=38194209&pos=6;-108#pos=6;-108

13. Lekachman, R. (1973). Inflation: The permanent problem of boom and bust. Free Download, Borrow, and Streaming: Internet Archive. Retrieved from https://archive.org/details/inflationpermaneoooleka

14. Mukhamediev, B. M. (2018). Inflationary processes monetary policy in the economy of Kazakhstan. Retrieved from https://be.kaznu.kz/index.php/math/article/view/770/744

15. Nargoziev, I. J. (2007). Regulation of inflation and inflation expectations: world experience and practice of Kazakhstan. Retrieved from https://cyberleninka.ru/article/n/regulirovanie-inflyatsii-i-inflyatsionnyh-ozhidaniy-mirovoy-opyt-i-praktika-kazahstana/viewer

16. National Bank of the Republic of Kazakhstan. (2021) Monetary Policy Strategy to 2030. Retrieved from https://www.nationalbank.kz/ru

17. National Bank of the Republic of Kazakhstan. (2022). Annual report 2021. Retrieved from https://nationalbank.kz/en/news/godovoy-otchet-nbk

18. Tolegenova, A., Zhetpisbayeva, A., & Sabyr, S. (2021). The impact of monetary policy on inflation in Kazakhstan: An ARDL approach. Journal of Economic Development, 46(1), 123-144

Financial Evaluation of Air Astana Group Amid Initial Public Offering (IPO)

Leila Ablayeva, Larissa Alexeyenko, Kirill Jamanchin

Abstract

The current diploma research work is intended to assess the financial performance of the leading Kazakhstani airline company, Air Astana JSC amid an Initial Public Offering (IPO). The financial valuation is conducted the by the implementation of the market-based and income-based approaches used in the valuation of the economic value of an enterprise financial valuation of the company is based on the financial information covering the five years, 2017-2021.

The market-based valuation was developed by calculation of the market multiplies by financial evaluation of the publicly listed airlines such as Aeroflot, Turkish Airlines, China Southern Airlines, American Airlines and Singapore Airlines representing different regional markets. The results of the market-based valuation approach determined the implied share price of Air Astana JSC at 7.05 USD or 3 149.86 KZT (1 USD= 446.79 KZT) (National Bank Currency, 06.04.2023).

However, the income-based valuation method had been based on the company's predicted future cash flows being discounted (Sean R. Saari, 2017). To obtain more relevant results, short-term and long-term cash flow forecasts were conducted. The determined discounting interest rate (WACC) equalled 9.4% given the corporate income tax rate of 20% and the existing debt-to-equity ratio of the target company (Air Astana JSC). The implied share price based on short-term cash flow estimations was equal to 1.92 USD or 857.83 KZT per share, while the long-term cash forecast derived with the implied share price of 22.15 USD or 9 896.39 KZT per share (1 USD= 446.79 KZT) (National Bank Currency, 06.04.2023).

Based on the outcomes of the valuation methodologies, it is determined that the income-based valuation method (based on long-term cash predictions) revealed overvaluation of the target business stock price, whereas the market-based valuation method demonstrated undervaluation of the firm.

Introduction

The current research work is dedicated to the financial evaluation of Air Astana Group, which is a leading national airline company in Kazakhstan. The financial evaluation is based the income and market methods. Before the financial assessment, the current section will address the company's background, the main purpose of the research as well as the research questions will be developed. The current research addresses the government initiatives of privatization of state-owned enterprises by offering the shares to Kazakhstani citizens. Hence, the work is important from the perspective of both Kazakhstani government and its citizens who are interested in purchasing the shares.

Research Purpose and Objectives

During the Presidential Address to the Nation in January 2022, President Kassym-Zhomart Tokayev addressed the renewal of the People's IPO (Initial Public Offering) during which Kazakhstani citizens will be privileged to purchase the stocks of the leading national companies owned by the Social Welfare Fund "Samruk-Kazyna" (Tengrinews.kz, 2022). IPO - is an initial public offering in which a company for the first time releases its papers on the market and they are acquired by investors. Thus, the public has the opportunity to become co-owners of the company, and own shares, even if they are small (kapital.kz, 2022). The main stages of the IPO are the selection and appointment of the right advisors, analysis of the timing of the IPO, approval of the type and placement of shares, as well as the creation of committees or departments to manage and control the process (kase.kz). Several concerns need to be addressed in light of the difficulties that international firms have had while going public (Financial Times, 2017). For instance, due to US sanctions, Aeroflot Airlines experienced a severe funding shortage; for American Airlines Group, the main issue was fierce market competition, which decreased cost shares. The corporation has had to contend with rising competition from other airlines, particularly low-cost airlines (The Guardian, 2013). According to China Southern Airlines' experience, the COVID-19 pandemic resulted in a fall in visitor numbers (Financial Times, 2021), whilst Turkish Airlines experienced a decline in tourism as a result of political unrest in Turkey and rising gasoline prices (WSJ.com, 2010). Some of the companies such as KEGOC, KazTransOil, Kcell and others have undergone the IPO in previous years. During the speech, the president ordered to accelerate of the IPO of the national companies and named KazMunaiGas JSC and Air Astana Group as two companies that will undergo IPO and will become publicly traded companies. While KazMunaiGas JSC had become a publicly listed company in December 2022 (Kapital.kz, 2022). However, the prospects of the IPO of Air Astana Group have not been clear despite the willingness of the company to become a publicly listed company leading to increased attention towards the company.

Taking into account the lack of official information about the approximate share prices of Air Astana Group, the current research work is aimed at conducting a financial evaluation of the Company. The work can benefit ordinary citizens that are interested in purchasing the company's shares, as well as private/public investment funds and the government. The work is based on the application of income-based and market-based valuation methods as they provide both comparative and industry-level insights about the enterprise's value. Moreover, additional tools such as SWOT, PESTLE, KPI and the airline industry will be applied to identify the current position of the enterprise regarding the competition as well as to identify the main risks that could negatively influence the IPO.

The following research objectives will be also addressed over the course of the research work:

To conduct an in-depth analysis of the industry factors, macroeconomic outlook and company-level factors influencing the financial soundness of the company ahead of IPO.

1. To conduct a financial evaluation of the company based on market-based and income-based approaches.

2. To identify the main macroeconomic, industry-level, and operational risks influencing on the company's financial performance.

3. To analyse the current risk management measures undertaken by the company.

4. To develop practical recommendations and vivid conclusions about the selected enterprise.

Research Questions

Moreover, the research work is focused on the following research questions, which will

be addressed over the course of the project:

1.   What are the main operational, industry and macroeconomic factors influencing the operational and financial performance of Air Astana Group?

2.   How does the company address the risks associated with changing business environment caused by economic, social, legal, and political factors?

3.   What is the current economic value of Air Astana Group in comparison with other publicly listed airlines (market-based approach)?

4.   What is the current economic value of Air Astana Group based on the income-based approach?

Definitions and Assumptions

This section of the research project is aimed at the analysis of the existing academic literature related to the financial evaluation of the companies. Moreover, the section will be subdivided into sub-sections including the key concepts, income-based and market-based evaluation methods, and the advantages, and disadvantages of evaluation methods.

Key Concepts

Before moving into the analysis of the main academic works dedicated to the financial evaluation of Air Astana Group, it is significant to define the main relevant concepts, which will be used in the research process.

Financial evaluation is one of the most commonly referred academic concepts in corporate finance. The term is defined as a process of applying different financial appraisal methods to determine the fair market value of an enterprise (Asia Development Bank, 2019). Based on the available financial data, which can be found in financial statements including the income statement, balance sheet, and statements of cash flows, a financial evaluation of a company is conducted (Schmidt, 2023). The discounted cash flow approach may be used to evaluate the company's financial position. The Discounted Cash Flow (DCF) model is a method for valuing investments that relies on projecting future cash flows and applying a rate of return that takes into account the risk involved for the investor (Shrieves & Wachowicz, 2001). It is one of the most commonly used financial evaluation approaches. Furthermore, the financial evaluation of an entity is focused on the appropriate levels of financial risk. Financial risk can be defined as "a probability of losing financial investments made into a project" (Holton, 2004).

Financial Evaluation Approaches

The financial evaluation of a company can be conducted by application of several methods. Indeed, DeCress (2021) has defined several approaches to financial appraisal. The three most commonly used approaches include the market approach, cost approach and Discounted Cash Flow model. The following Figure 1 represents information about three types the financial evaluation:
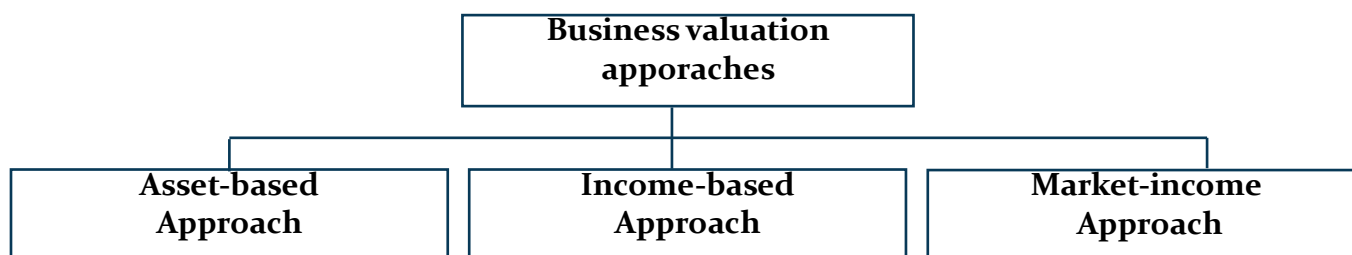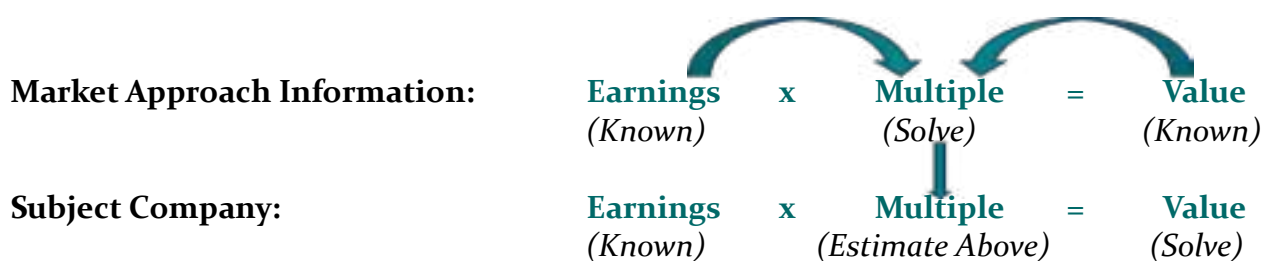

Figure 1: A company/asset valuation approach (DeCress, 2021)

The asset approach or cost approach is defined as a financial evaluation method based on the asset and the cost of the replacement (Hayes, 2023). The method operates on the following equation: Tangible and intangible assets' current value fewer current liabilities equals current equity (DeCress, 2021). The net asset method is considered the main method of the asset-based approach that is based on the aforementioned formula (DeCress, 2021). The net asset method is considered to be effective in case of the holding companies or capital-intensive enterprises. Deev (2011) outline the potential advantages and disadvantages of the asset-based valuation method. According to

the author, the main benefit of the asset-based approach was that it is easy to apply and simple to understand. Moreover, the approach is not based on any assumptions and the numbers are derived from factual financial information. The net asset method is inferior in using it to predict the future of the firm because it is based on trustworthy information about the real assets that the enterprise has, eliminating abstractness.

The market-based approach to financial valuation is based on the comparison of similar companies in the industry. The following Figure 2 represents the application of the market-based approach of valuation:

Market Approach Information:	**Earnings** *(Known)*	x	**Multiple** *(Solve)*	=	**Value** *(Known)*
Subject Company:	**Earnings** *(Known)*	x	**Multiple** *(Estimate Above)*	=	**Value** *(Solve)*

Source:
ABV Examination Review Course: R. James Alerding, CPA / ABV, ASA; Andrew C. Blank, CPA/ABV; Chad Hoekstra, CPA / ABV, CFF; Jason MacMoran, CPA / ABV, CFF, CVA; Courtney N. Mussatt, CPA / ABV

Figure 2: Market-based approach of business valuation (DeCress, 2021)

DeCress reported that the market approach is based on the multiples derived from the transactions of the earnings and value information (DeCress, 2021). The method determines key multiples and applies them to the target firm to determine the value of the company. Goh, et al., (2015) highlighted the benefits of the valuation method. According to the authors, the main benefit of the market-based method was that it is built on the actual data and financial information the identical companies in the industry (Goh, et al., 2015). Moreover, the method was considered as moderate complexity since it requires certain calculations to derive the multiples, which are based on the available financial information. However, Deev (2011) argued that the approach requires assumption development, and it is limited to the present-time information as the analysis is retrospective (using theoretical information). The selection of identical public companies was considered as another challenge of applying the market-based

approach the in financial valuation process. The third business valuation approach is an income-based approach, which is considered the main valuation method in finance (DeCress, 2021). The capitalization of cash flows and discounted cash flow methods are two examples of income-based methodologies. The capitalization of the cash flow technique is based on the assumption that a firm or investor anticipates long-term cash inflows from an investment. Therefore, the cash inflows are converted into values being divided by the rate adjusted to the growth rate.

Kiss (2015) accentuated on the flexibility of the income-based approach to the changes. Furthermore, the approach is future-oriented and takes into consideration the future cash flows in line with the market changes (discounting interest rate). Additionally, the method considers the time value of money (Kiss, 2015). Nevertheless, the complexity of the approach is perceived as one of its shortcomings. Indeed, the income-based approach requires an accurate measure of

future cash flows as well as interest rates used for discounting purposes. As a result, it requires elevated levels of expertise and time. It is worth noting that the method is based on probabilities and assumptions that can be easily manipulated.

The next tables outline the main Key Performance Indicators used by Air Astana to measure its operational performance:

№	KPI name	Definition	Formula
1	The total number of passengers	The total number of passengers being carried out by an airline	Total Passengers = business + economy + infant + charter + staff
2	Total Revenue	Total revenue being made in the period	Total Revenue = Passenger Revenue + Cargo&Mail Revenue + Other Revenue + Gain from Sale-Lease-Back
3	Load Factor	The % seats that have been occupied by travelers	Load factor = average load/peak load
4	Net Profit/Loss	The net profit/loss for the period	Net Profit/Loss = Total Revenue - Total Expenses
5	Greenhouse gas emission	Total GHG emissions produced by the company	GHG Emissions = A*EF, where A is data on production/rendering services and EF is emission factor
6	Net Promoter Score	The measurement used for calculating the customer loyalty from -100 to 100 score	NPS score = % of Promoters - % of Detractors
7	On-time performance	The timelines of the flights carried out	On-time performance = (Actual Flight Time - Scheduled Flight time)/Scheduled Flight time
8	CASK	CASK (Cost of Available Seat Kilometer) or Casm is a measure commonly used in airline industry that is a unit cost. It is a measured in cents and measures the cost of a seat mile being offered	CASK = Total Cost/Number of passesngers
9	Operating profit	The profit from the main operations	Operating Profit = Operating revenue - Operating expances

Table 1: KPIs and definition

Research Methodology

The development of an appropriate research methodology is one of the key factors influencing the research data quality since based on the methodology appropriate assessment tools will be selected.

Research Methodology

To achieve research goals and objectives, it was decided to rely on two valuation approaches such as income-based and market-based approaches.

Both types of valuation approaches will be based on the financial information derived from the official annual reports of the subject company (Air Astana Group) and selected peer companies covering the period of 2017-2021 as some of the peer companies used in the market valuation have not yet published their results for 2022.

Income-based approach

The basis for the income-based valuation technique is the forecasting of future cash

flows and the use of a discounting model to get the Weighted Average Cost of Capital (WACC) (Gordon, 2022). Given two essential factors influencing on the valuation quality such as FCF estimations and WACC, it was decided to implement short-term and long-term FCF forecasting. The short-term FCF forecasting is based on financial information from the last three years of company operations and the forecast will cover the period of 2017-2022. The long-term FCF, on the other hand, will be calculated using the revenue/passenger flown method and the projection horizon will span ten years.

Market-based approach

The market-based approach will be based on the analysis of five publicly listed airline companies including Singapore Airlines, Turkish Airlines, Aeroflot, China Southern Airlines and American Airlines. The multiplies used in the market-based approach will include the following ratios:

1. Earnings per share (EPS).
2. Price to Earnings (P/E) ratio.
3. Price to Book (P/B) ratio.
4. Price to Sales (P/S) ratio.
5. Economic Value/EBITDA.
6. Economic Value/EBIT.
7. Economic Value/Sales.

The financial information used in the estimation of the multiples will be based on the annual financial statements of the companies covering the period of 2017-2021. In the calculation of the market multiples, the 2021-year financial information will be used.

Method Justification

The financial valuation of an enterprise requires objective assessments, which would provide accurate information about the company's value. Therefore, the application of two methods such as market-based and income-based approaches could enhance the understanding of an enterprise's value positively influencing the research findings. Moreover, the market-based valuation approach will provide an opportunity to compare the selected target company with the regional and international airline companies. However, it is important to note that benchmarking against other companies based on the market approach may have potential shortcomings as selected companies could be larger in terms of operations as well as revenue turnovers. Nevertheless, such a comparison could provide an opportunity to analyse the financial performance of selected companies with the target company's performance. Overall, the application of the market-based and income-based approaches could provide significant and more detailed information about the target company's financial performance as well as its value. Moreover, the mixed method will ensure obtaining information from various sources providing more validity and reliability.

Airline Industry Outlook

The analysis of the current outlook in the airline industry of Kazakhstan will be considered in this section. The section will address key factors influencing the airline company operations, the impact of COVID-19 as well as increasing jet fuel prices. The analysis will provide insightful information about the key political, market, social as well as economic factors influencing airline operations.

Company Background

Being established as a joint venture in 2001, Air Astana Group made its first flight on May 15, 2002. Since then, the company has become one of the most successful airline startup companies in the post-Soviet region with one of the highest growth rates (AirAstana.com, 2023). The joint venture was established by the government of Kazakhstan and BAE Systems PLC (United Kingdom) with the majority share owned by the government of Kazakhstan at 51% (Annual Report, 2023). BAE Systems PLC owns 49% of the company (AirAstana.com, 2023). The company's strong compliance with the safety requirements enabled it to achieve regional and international recognition. Indeed, Air Astana Group possesses the European Aviation Safety Agency's part 145 approval allowing flights to European countries (AirAstana.com, 2022). In May 2021, the company successfully passed Air Transport Association's Operational Safety Audit for the 8th time (AirAstana.com, 2022). To cater to Kazakhstani customers who are price-conscious and to support the growth of the nation's competitive aviation sector, Air Astana Group launched Fly Arystan in 2019 (AirAstana. com, 2019). According to the company's Annual

Report, Air Astana Group has 29 aircraft consisting of Boeing 767-300, Airbus A320neo, Airbus A321, Airbus A321neo LR, Airbus A321neo, Embraer E190-E2 (AirAstana.com, 2022). As of 2022, the total number of aircraft leased by Fly Arystan was equal to 14 Airbus A320 aircraft.

Kazakhstani Airline Industry

The Kazakhstani Airline Industry can be considered relatively small, but it is one of the dynamically developing and growing markets in the world. Peter Foster, the CEO of Air Astana Group reported that the Kazakhstani airline market was the fastest-growing market in the post-pandemic period. According to the Aviation Administration of Kazakhstan, there are 53 Kazakh air operators registered in the country, which cover different segments including commercial, charter, cargo, and others (Annual Report, 2021). Air Astana is considered one of the six airlines in Kazakhstan with the EU safety certification to fly to European countries. As of April 2019, the total number of international airlines with regular flights to Kazakhstan was equal to 24 (passenger flights) and 5 (cargo operations). The total number of airports in Kazakhstan is equal to 20 and 18 of them are eligible for international flights. The majority of the airports are state-owned or privately-owned companies except for the Aktau International Airport which is based on public-private ownership. The following two pie charts demonstrate the market share of Air Astana in relevance to other major airlines in Kazakhstan in the domestic and international flights market:

Figure 3: The domestic and international market share of Air Astana Company in 2021 (Annual Report, 2021)

It is important to note that the information is for the 2021 year ended and it is expected that there would be changes in the structure of the international market as of 2022 since Aeroflot Company might have lost its market share. It is important to note that the development of the aviation industry in Kazakhstan is dependent on capacity building and infrastructural developments. It is necessary to note that a new terminal in Shymkent International Airport is under the construction process adding up 35 000 square meters leading to an increase in the passenger capacity from 150 to 2000 passengers. Moreover, in the Western Kazakhstan region, the Uralsk International Airport is under the expansion process to double its size to increase the airport capacity from 100 passengers to 200 passengers. It is worth noting that the Kazakhstani aviation industry has passed ICAO Coordinated Validation Audit and the safety compliance levels of the industry reached 84% which was 15% higher than the global average rate in the post-pandemic period.

Infrastructural Developments

According to the Annual Report of Air Astana Group (2021), the domestic routes have been completely restored and the rising demand for the flights contributed to the launches of new domestic destinations to develop domestic tourism. The new flights were launched to Turkestan, Alakol, Shuchinsk-Borovoe and Balkhash. Overall, the international flight routes have restored 66% of pre-pandemic levels operating in 65 international directions.

Cargo Traffic

Overall, cargo traffic has demonstrated rapid growth in 2021 with an increase of 18.7% in cargo ton-kilometres (CTK). Compared with the year 2018, the cargo segment demonstrated

an overall increase of 3.5% (Annual Report of Air Astana, 2021). It is significant to mention that since the launch of the cargo services, it was the second record level of cargo increases. Nevertheless, it is important to note that the performance results of the cargo sector could even be higher unless available cargo ton-kilometres had not decreased by 10.9% in comparison with the results of 2019. Moreover, increased international traffic has enabled more cargo capacity in Air Astana. In addition, it is important to highlight that freight deliveries as well as conversions have demonstrated a rapid growth rate of 25.9% (Annual Report of Air Astana, 2021). The demand for imported goods was high, particularly in case of the PPE.

Ongoing Geopolitical Tensions

One of the considerable influences on the airline industry of Kazakhstan was the ongoing military conflict between Ukraine and Russia, which led to the loss of these market segments by the Kazakhstani airline companies resulting in revenue losses ranging between 8-10% (Annual Financial Report of Air Astana, 2022). Since February 2022, both Air Astana and Fly Arystan suspended their flights to and over Russia and Ukraine (Annual Financial Statements, 2022). As a result, Air Astana with its subsidiary brand, Fly Arystan have lost revenue of 8% and 2% respectively. Taking into consideration that the global as well as regional airline industries have non completely recovered from COVID-19, the geopolitical tensions between Ukraine and Russia forced the airlines to suspend their flights and re-direct their flight capacities to other destinations. The suspension of the flights to Russia was due to the removal of the insurance of the flights to the country within the framework of the economic sanctions. Hence, the majority of insurance companies refused to provide insurance for flights to and from Russia (Bartlett, 2022). Furthermore, the airline industry has experienced jet fuel shortages due to the imposed economic as well as financial sanctions on the Russian fuel producers, which were the main suppliers of the jet fuel for Air Astana Group. Kazakhstani airlines had to rely on Russian jet fuel manufacturers due to the low capacity as well as unaffordable prices in the domestic markets. The imposed sanctions against Russia increased the complexity of fuel imports into Kazakhstan. Moreover, the economic sanctions increased the internal demand for jet fuel in Russia, which was due to its use by Russian airlines (commercial and military). It is also necessary to note that the geopolitical situation between Russian and Ukraine has influenced the operational complexities related to the supply of the materials, the aircraft technical maintenance and engineering, the supply of aircraft lubricants as well as other aspects related to the effective operations of aircraft.

COVID-19 Outlook

Even though the global pandemic is near its end, it was one of the main negative factors influencing both domestic and international travel. Indeed, as of 2020, Air Astana Group reported overall losses of 94 million USD due to COVID-19 and related restrictions (Bartlett, 2022). Indeed, it was one of the rare moments when the company reported the losses. The impact of the pandemic was considerable in 2021 influencing the ability of the company to operate domestically as well. Hence, the company maintained its domestic route quantity at previous levels of 30, whereas the subsidiary Fly Arystan had increased the overall number of domestic routes from 21 to 24. The 2021 year was marked by the record elevated levels of passenger carriage in the history of the airline with 6.6 million passengers, which was 79% higher than the 2020 performance. The low-cost subsidiary, Fly Arystan conducted almost half of the total passenger traffic, whose revenues were driven by high domestic demand for flights. Furthermore, it is important to consider that COVID-19 was still a relevant factor, which forced the company to review its five-year business for the 2022-2026 period. In 2022, some of the international routes of the company were challenged by the COVID-19 restrictions in some tourist destinations, while the others continued to re-open and close due to the COVID-19 infection spikes. In 2022, the Chinese market for Kazakhstani airlines was still closed due to ongoing COVID-19 restrictions.

Jet Fuel Price Surge

The jet fuel costs represent the largest proportion of the operating expenses of Air Astana Group. The ongoing military conflict between Russia and Ukraine contributed towards increased demand for crude oil and gas prices throughout 2022. Indeed, International Air Transport Association (IATA) monitors

the fuel prices. As can be observed from Figure 4, jet fuel prices have been fluctuating globally:

Jet fuel price developments - longer term perspective
Jet Fuel & Crude Oil Price ($/barrel)

Figure 4: Global Brent Oil Price movements vs. jet fuel price movements (IATA.org, 2023)

As can be noted from Figure 4 above, there is a positive correlation between oil and jet fuel prices. The graph demonstrates that in the last two years, both oil and jet fuel prices have been surging. The peak period was 2022. Taking into account the shortage of imports of jet fuel from Russia in 2022, Air Astana Group has been exposed to jet fuel price fluctuations. However, to reduce the negative effect of price fluctuations, the Group implements hedging techniques by implementing financial derivative instruments. To do so, the Group purchases the Asian call options and enters into contractual agreements with an investment bank.

Overview Of Air Astana Group

Key Performance Indicators

Air Astana Group is a group of companies consisting of Air Astana JSC and Fly Arystan. Fly Arystan is a low-budget airline company and is a subsidiary of Air Astana JSC. The Group operates in both international and domestic routes which are 64 in total. According to the Annual Report of the Group (2021), the key performance indicators include the followings:

1. The total number of passengers.
2. Total revenue.
3. Load factor.
4. Net profit/Loss
5. Greenhouse gas emissions
6. Net Promoter Score
7. On-time performance
8. CASK
9. Operating Profit

The total passenger numbers are considered one of the significant KPIs of the company. The following Figure 5 represents information about the total number of passengers flown in 2019-2021.
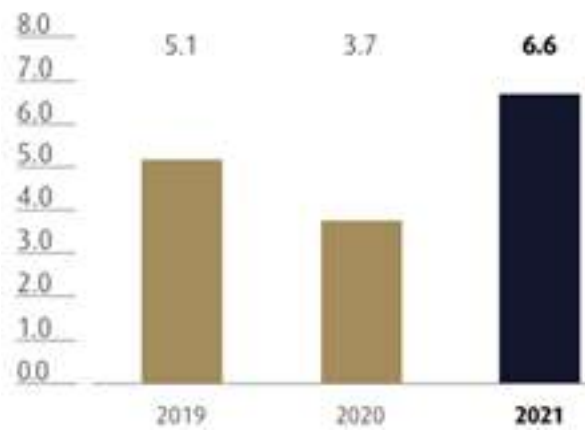
Figure 5: Total number of passengers flown in 2019-2021 (in millions of people) (Annual Report of Air Astana Group, 2021)

The dramatic drop in total passenger traffic in 2020 was related to the COVID-19 pandemic and relevant restrictions. However, in 2021 there was a bounce-back effect with the total number of passengers increasing to 6.6 million people surpassing pre-pandemic results in 2019.
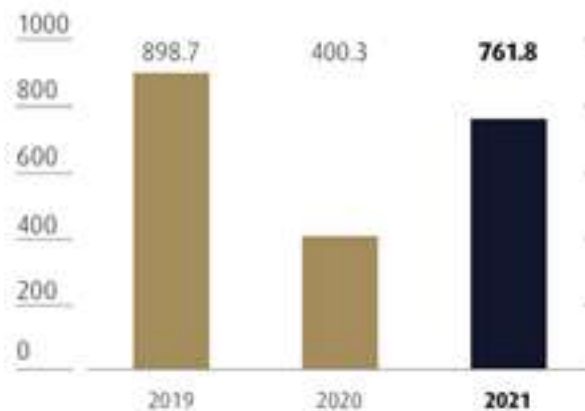
Figure 6: Total revenue trends of Air Astana Group in 2019-2021 (in thousands USD) (Annual Report, 2021)

As it can be noted from Figure 6, there is a positive relationship between the total passenger flown and total revenues leading to the conclusion that most of the company's revenues are from the passengers. Another KPI measuring the operational performance of the Air Astana Group is the total load factor. The following Figure 6 represents information about the total load factor:
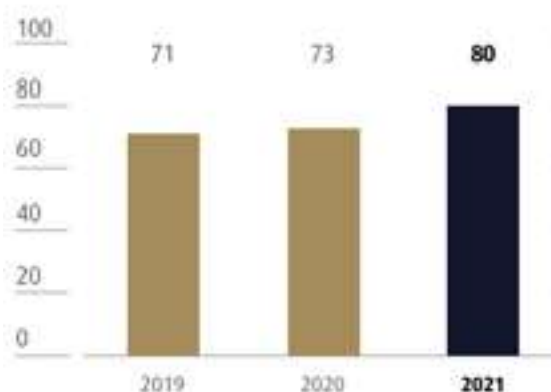
Figure 7: Total load factor in 2019-2021 (in %) (Annual Report, 2021)

By dividing the total number of people by the total number of available seats, the total load factor is calculated. Indeed, the Group has demonstrated outstanding performance in terms of load factor that upbeat the results of the pre-pandemic period with the 80%. The net profit of the company during the pandemic decreased as can be observed in the following Figure 8:
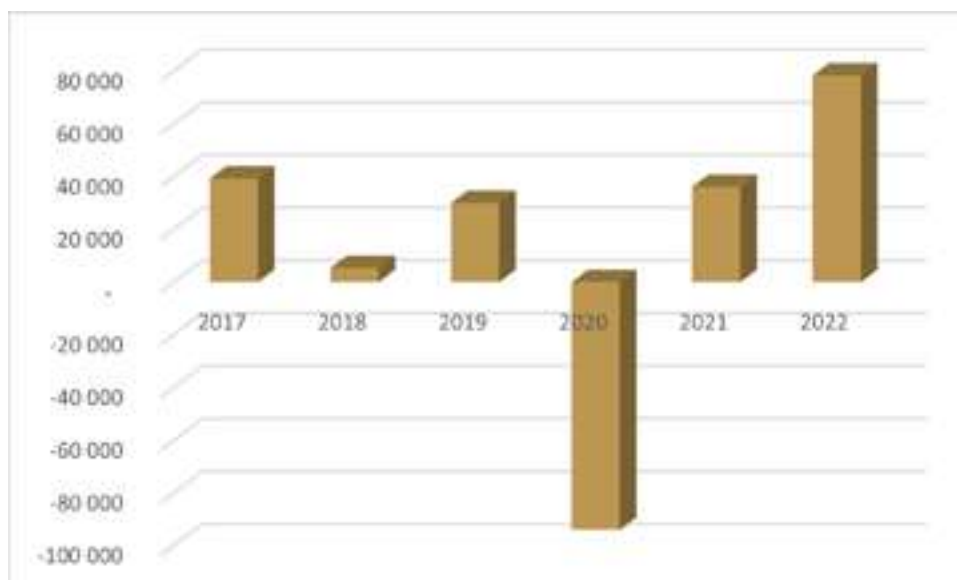
Figure 8: The net profit in 2019-2021 (in million USD)

As can be observed from the graph above, the company's net profit after taxes in 2021 was equal to 36.1 million USD, which was higher than the pre-pandemic period. It is important to note that Air Astana Group reported record high levels of net profit in 2022 with 78.414 million USD (Annual Financial Statements, 2022). Furthermore, the following Figure 9 represents the summary of other performance indicators:

Figure 9: GHG Emissions, Net Promoter Score and On-time Performance Indicators
(Annual Report, 2021)

Based on the graph above, it can be concluded that the company's GHG emissions decreased slightly in 2021 in comparison with 2020 results. On the other hand, the Net Promoter Score had slightly improved by one. Nevertheless, the Group's on-time performance decreased from 88% in 2020 to 82% in 2021, which could be related to the increased air traffic. In addition, the CASK (cost of available set kilometres) also demonstrated a slight decrease from 5.78 cents in 2020 to 5.11 cents in 2021. The following graph demonstrates information about the operating income of the company in 2019-2022.
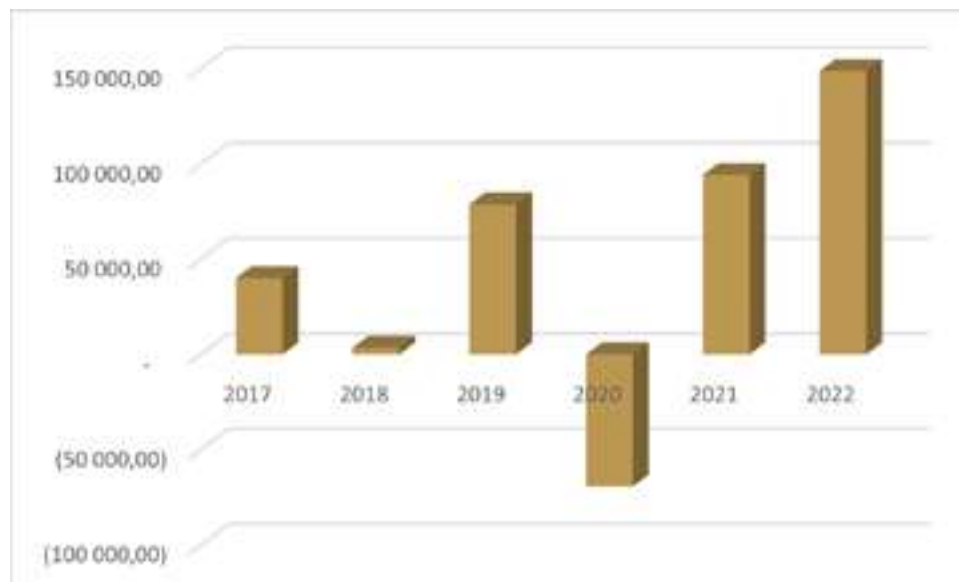
Figure 10: Operating income of Air Astana Group in 2019-2022 (in million USD)

Based on the observation of Air Astana's net profit levels, it can be concluded that the Group's operating income (EBIT) will demonstrate similar trends. As noted in Figure 9, the operating income levels peaked in 2022 equalling 148.715 million USD (Annual Financial Statements, 2022).

Fly Arystan

Fly Arystan is a subsidiary company that belongs to Air Astana JSC. Being founded in 2018, the brand is focused on low-budget passengers and aims at developing domestic routes mostly. Currently, the company's fleet consists of Airbus 320 aircraft. In total, there are 17 aircraft operating in both domestic and international markets. In total, the company flies to 34 destinations.

In 2022, the company was awarded a four-star rating making it one of the 5 companies with such a rating. As it was mentioned earlier, the company's domestic market has demonstrated strong performance. Indeed, in the domestic market, Fly Arystan's market share accounted for 39% and the company's total number of passengers has been steadily increasing as new domestic and international routes were launched.

Future Strategy

Air Astana Group has become the leading airline group in Central Asia and India, which is supported by its annual recognition in Skytrax awards . The company's future is focused on the commitment to connect Kazakhstan with the rest of Eurasia through the provision of true Kazakh hospitality. Moreover, the Group is considered as one of the key drivers of economic relations by connecting the largest landlocked country with the world. The launch of Fly Arystan enabled the Group to increase domestic mobility inside the country. To achieve this strategy the Group focuses on the following aspects:

1.   Responding with the highest possible level of agility.

2.   Harnessing efficiency.

3.   Focusing on service excellence.

There are three main aspects of the future strategy at Air Astana Group to achieve its overall corporate strategy.

SWOT and PESTLE analysis

SWOT analysis' main findings are summarized on the following Table 2:

Table 2: SWOT analysis summary

Strengths	Weaknesses
• Well-established world-class passenger service. • Dominant market position as a national flag carrier of Kazakhstan. • Modern aircraft fleet with three types of aircraft: Boeing, Airbus and Embraer with a maximum of 8 years of exploitation. • International recognition and awards for excellence. • The strategic partnerships with leading international airlines. • High level of commitment towards CSR and ESG principles. • Strong and effective financial management. • Effectively governed company. • Strong expertise and contribution towards the airline industry development in Kazakhstan. • High level of reliability and safety. • State-of-art airline operations in engineering, maintenance, and servicing. • Ab-initio and A66 programs to nurture the company's pilots and engineers. • Transparent and effective corporate governance.	• High level of dependence on the limited Kazakhstani market. • High level of vulnerability to political and economic changes as a quasi-governmental organization. • Low level of international presence of the company. • Inflexible pricing strategies that contribute towards uncompetitive prices compared with other rivals. • Limited ability to expand on the regional and international levels. • Limited distance capacity of the aircraft to reach long-distance destinations. • Threats • Air Astana faces intense competition from international and regional carriers entering the Kazakhstani market. • High level of economic and political instability. • High levels of security and safety risks imposed by the industry. • Intensifying environmental regulations in Kazakhstan. • Increasing jet fuel prices. • Economic sanctions imposed on Russia affecting the company's operations.
Opportunities	Threats
• The potential expansion into Asian and Middle Eastern markets. • Development of alliances and partnerships with international airlines. • Developing new routes. • De-regulation of the visa regimes in tourist destinations by the Kazakhstani government. • The growth of domestic tourism in Kazakhstan. • Embracing digital transformation by leveraging IT.	• Air Astana faces intense competition from international and regional carriers entering the Kazakhstani market. • High level of economic and political instability. • High levels of security and safety risks imposed by the industry. • Intensifying environmental regulations in Kazakhstan. • Increasing jet fuel prices. • Economic sanctions imposed on Russia affecting the company's operations.

The following Table 3 represents key findings from the PESTLE Analysis of Air Astana Group:

Table 3: PESTLE analysis summary

Political	Economic
• Strengthening governmental regulations. • The vulnerability to the political factors and situation in neighbouring countries (e.g., Russia, Kyrgyzstan). • The political instability inside Kazakhstan is caused by domestic, social, and economic factors. • Changing diplomatic and political relations with the EU and other Western countries.	• Rising inflation rates in Kazakhstan. • The growth of Air Astana depends on the growth of the national GDP of the country. • Constant exchange rate fluctuations and devaluation of the national currency. • The dependence of the national economy on oil exports. • Rising competition from domestic and international airlines.
Social	Technological
• Changing demographics and the need to adapt to a new generation of passengers both business and leisure. • Technological advancements influencing brand perception, marketing communication and other aspects of digital innovations aimed at operational efficiency and customer service. • Constantly changing travel patterns and the demand for new directions. • Changing passenger lifestyles. • Emergence of the middle-income social class.	• The digitalization of customer services and experience. • The Big Data Analytics. • Constant technological advancements such as new payment systems, new operational systems, and platforms. • Cybersecurity and threat issues as the transactions become digital. • Online booking platform and systems with user-friendly and easy-to-navigate characteristics.
Legal	Environmental
• Strengthening of environmental regulation in Kazakhstan. • Changes in the Tax Code and Labor Codes. • Additional controls over the foreign payments to the counterparts. • Strengthening of anti-trust laws and anti-monopoly regulations. • Additional legal requirements on corporate safety and security. • New legal regulations enhancing customer rights and protection. • International regulations of controlling, monitoring, and complying.	• Climate change and GHG emissions require Air Astana to take further steps to minimize the negative impact of its operations. • The need to address environmental sustainability. • The introduction of ESG (Environmental, Social and Governance) is mandatory. • The potential disasters such as earthquakes: Air Astana's fleet is mostly located in seismically active regions (Almaty City).

Financial Valuation Of Air Astana Group

This section of the research work is intended to analyse the results of market-based and income-based valuation approaches. The section first outlines the general information including the results of the financial ratio analysis, the descriptions of the selected airlines, the market-based approach, and the income-based approach findings. The following Table 3 demonstrates information about the peer companies included in the analysis:

Company	Country
Aeroflot Airlines (AFLT)	Russian Federation
American Airlines Company (AAL)	The United States of America
China Shouthern Airlines (ZNH)	China
Singapore Airlines (SINGY)	Singapore
Turkish Airlines (THYAO)	Turkey

Table 4: Benchmark Companies

Financial Ratio Analysis

Aiming to analyse the financial performance of the target and selected companies, three types of financial ratios such as profitability, liquidity and debt ratios were analysed. The financial ratios were calculated based on the financial information covering the period of 2017-2021 for each company. For some graphs, the average value of the indicators for 5 years was used, and for some graphs individual years were considered. Also, the financial ratios of Air Astana can be found in Appendix 3. The following Figure 10 represents information about the profit margin ratios:
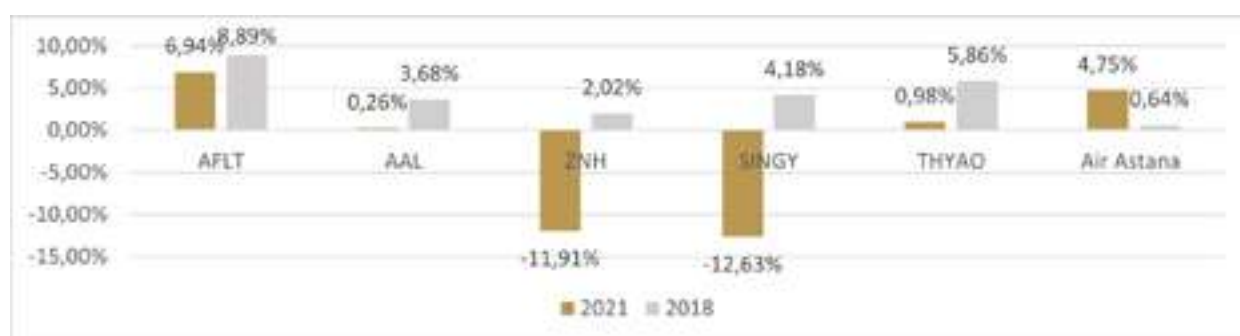
Figure 11: Profit Margin Ratios of Air Astana and Five selected airlines

The profit margins were calculated for 2021 and 2018 separately to compare the results before and after the pandemic period. As can be observed from the graph, out of six companies including Aeroflot, American Airlines, China Southern, Singapore Airlines, Turkish Airlines and Air Astana, Aeroflot showed the highest profit margin result in 2018. Looking at 2021, it can be concluded that Air Astana performed well after the pandemic period, while China Southern and Singapore Airlines demonstrated negative margin profit.

Nevertheless, the analysis of the gross profit margin ratios applying the averaging method demonstrated that Air Astana Group demonstrated the highest ratio out of the six companies included in the valuation.
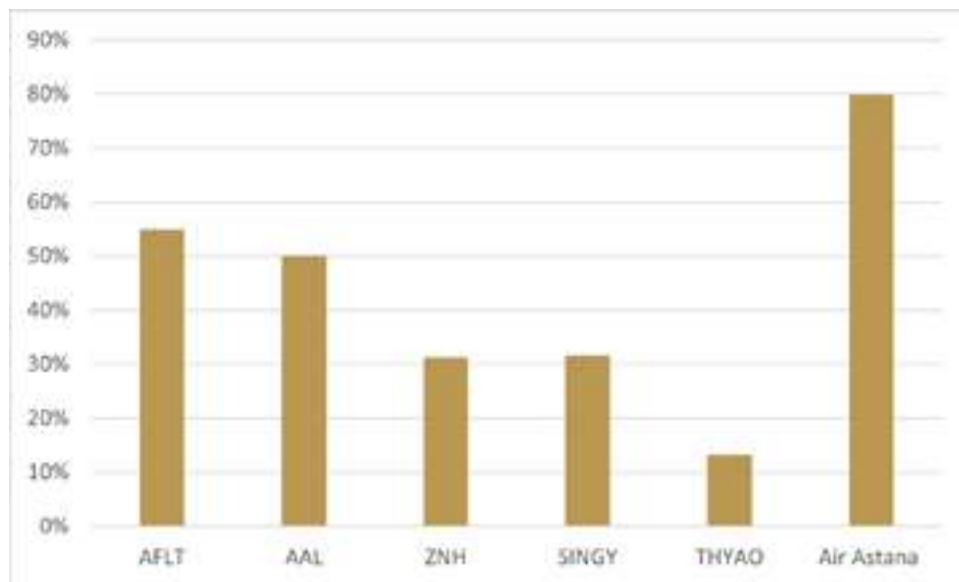
Figure 12: Gross Profit Margin of selected companies vs. Air Astana

Furthermore, the three types of returns Return on Sales (ROS), Return on Assets (ROA) and Return on Equity were calculated. The following Figure 13 and Figure 14 show the ROS and ROA of selected companies
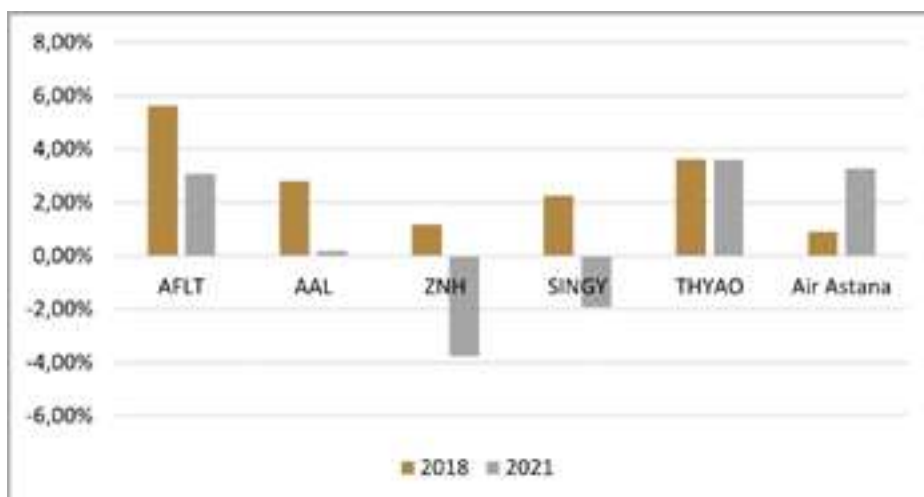
Figure 13: ROA ratios of selected companies
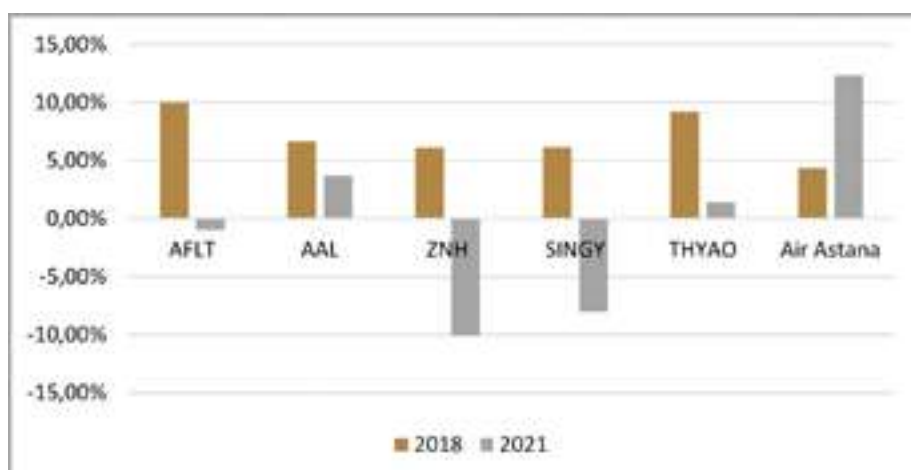
Figure 14: ROS ratios of selected companies

Looking into the financial ratios of six major airlines – Aeroflot, Air Astana, American Airlines, China Southern, Singapore Airlines, and Turkish Airlines – for the pre-pandemic year of 2018 and the post-pandemic year of 2021 the ROA and ROS of these companies were higher in 2018 than in 2021. This is due to the COVID-19 pandemic's effects, which severely hurt the aviation sector in 2021 and resulted in a sharp drop in profitability. On the other hand, 2018 was a pre-pandemic year when the industry was thriving with growth and expansion. The higher ROA and ROS in 2018 were due to strong demand for air travel, stable fuel prices, and lower operating costs. The global economy was performing well, and people had more disposable income to spend on travel. With fewer competitors, than there are now, the competition was also less fierce. In conclusion, these airlines were more profitable in 2018 due to the good operating environment and increasing demand for air travel. Furthermore, to evaluate the liquidity level of the selected companies regarding Air Astana Group, three ratios as Current Ratio, Quick Ratio and Cash ratios were calculated by applying the arithmetic mean covering the last five years:
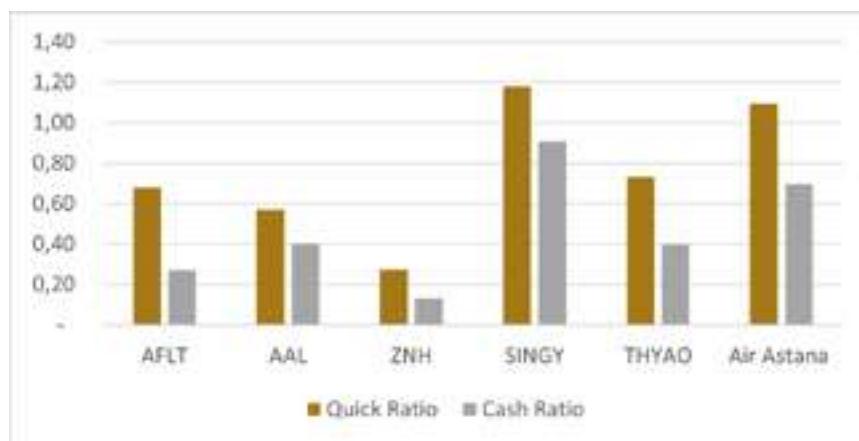
Figure 15: The liquidity ratio analysis of selected companies and Air Astana

According to the liquidity ratio analysis, it is possible to conclude that Air Astana outperforms other companies. For instance, the current ratio of Air Astana Group was higher than 1.2 and the quick ratio was higher than 1. On the other hand, Singapore Airlines (SINGY) maintained the current and quick ratios slightly above 1, while the cash ratio was slightly below 1. Turkish Airlines' liquidity ratios were lower than 1 and its cash ratio was equal to 0.4 in the five years. Moreover, the debt ratios were calculated to understand the nature of the capital structure in selected companies. As can be noted from Figure 15, all of the airlines demonstrated important levels of indebtedness:
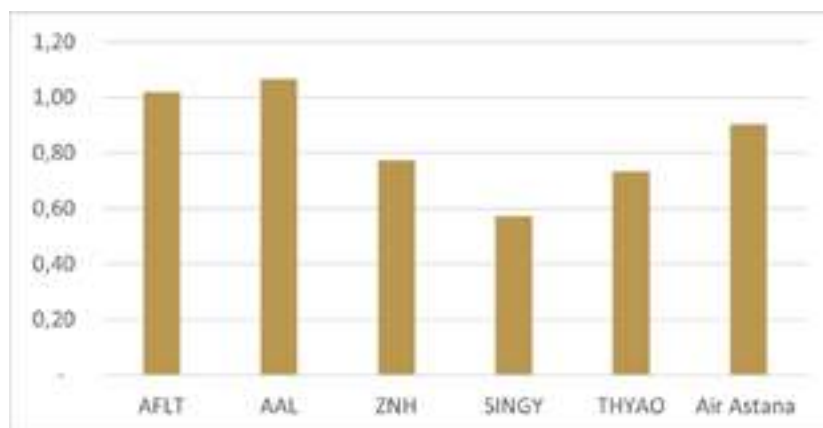
Figure 16: The indebtedness ratio of selected companies and Air Astana

Overall, it can be concluded that selected peer companies and Air Astana shared several similarities. For instance, the ratio analysis demonstrated that all airlines share an important level of debt meaning that they tend to prefer debt financing over equity financing. However, it is necessary to highlight that the majority of the airline liabilities are derived from the aircraft lease obligations that make up a significant share of the debt structure of the respected companies.

Market-based Valuation Approach

Multiples Calculation

Table 5 shows information about the multiple calculations of the benchmark companies and Air Astana Group. An explanation of the multiples can be found in Financial Evaluation Approaches and Research Methodology parts.

'ooo USD	Air Astana	Aeroflot	American Airlines	China Southern Airlines	Singapore Airlines	Turkish Airlines	Average
Sales	715 794,00	491 733,00	48 971,00	101 644,00	7 614,80	97 378,00	
EBIT	94 160,00	-4 757,00	1 805,00	-10 238,00	-610,70	1 414,00	
NI	36 159,00	34 106,00	127,00	-12 106,00	-962,00	959,00	
Depreciation	120 832,00	120 506,00	2 298,00	24 241,00	1 999,60	76,00	
EBITDA	214 922,00	115 749,00	4 103,00	14 003,00	1 388,90	1 490,00	
Assests	1 102 193,00	64 716,00	64 716,00	323 211,00	7 868,60	26 537,00	
Cash and Cash Equivalent	226 357,00	8 965,00	8 965,00	21 456,00	21 456,00	2 682,00	
Interest-bearing Debt (Book Value)	789 179,00	815 484,00	37 128,00	149 190,00	14 430,10	14 020,00	
Equity (Book Value)	63 974,00	-146 438,00	-5 799,00	67 851,00	22 800,40	6 836,00	
Market Value of Debt	710 261,00	733 935,60	33 415,20	134 271,00	12 987,09	12 618,00	
Market Value of Equity	0,00	67 036,26	10 123,96	574 213,15	17 063,07	189 888,00	
Total shares outstanding	17,00	2 396,72	650,64	16 948,44	2 967,49	1 380,00	
Stock Price (Yearly average)	0,00	27,97	15,56	33,88	5,57	137,60	
EPS	2 127,00	14,23	0,195	-0,71	-0,324	0,69	2,82
P/E	1,0	2,0	79,72	-47,43	-17,74	198,01	42,90
P/B	2	0	-1,75	8,46	0,75	27,78	6,96
P/S	3	0	0,21	5,65	2,24	1,95	2,04
EV/EBITDA	2	7	8,43	49,06	6,19	134,11	40,93
EV/EBIT	5	-166	19,15	67,11	-14,07	141,32	-17,44
EV/Sales	1	2	0,71	6,76	1,13	2,05	2,45

Table 5: Multiplies Calculation

Based on the calculated peer company multiplies, the following implied share price was calculated:

Valuation Implied by EV (in thousands, except per share price)							
Item	Target Company	Multiple	Implied Enterprise Value for the Target	Less: Net Debt	Implied Equity Value for the Target	Total outstanding shares	Implied Price for the Target
EBIT	94 160	-17,4	- 1 642 119	483 904	- 2 126 024	1 700 000	-1,3
EBITDA	214 992	40,9	8 798 752	483 904	8 314 847	1 700 000	4,9
Sales	715 794	2,5	1 754 622	483 904	1 270 718	1 700 000	0,7
							$1,5

Table 6: Implied Enterprise Value by Market-based approach valuation

Valuation Implied by Share Price			
Item (per Share)	Target Company	Multiples	Implied Share Price for the Target
Earnings	$1,00	44,01	$44,01
Book Value	$2,00	(15,95)	-$31,91
Sales	$3,00	1,56	$4,67
			$5,6

Table 7: Implied Share Price by Market-based approach valuation

Overall, it can be concluded that the overall share price of Air Astana by the market-based valuation approach was equal to 7.05 USD per share. The market-based valuation approach has demonstrated that the average implied share price was equal to 7.05 USD or 3 149.86 KZT per share (1 USD= 446.79 KZT) (National Bank Currency, 06.04.2023). Through the results, it may be concluded that the market share price of Air Astana was lower in comparison with peer companies. The main reason for these differences in prices per share was that the benchmark of the compared companies with Air Astana in terms of volume and cash turnover is several times larger. Also, the air companies have different market shares. For instance, Air Astana does not have a lot of international flights compared to other companies, which directly affects its revenue and financial indicators.

Income-based Valuation Approach

As it was already mentioned, the two most important elements of the income-based valuation method are an accurate cash flow estimation and the determination of the discount rate to be implemented in determining the company's value. Moreover, it is necessary to highlight that the Free Cash Flow estimations were made for short and long terms. With short-term FCF and long-term FCF, it is possible to look at the forecast in the long and short term and compare their results with each other. For short-term FCF estimations, the main advantage is the current and new information taken over the past few years. This means that the calculations will be more up-to-date and closer to the present day. The peculiarity of long-term FCF is that to calculate the Total Revenue the data of passenger traffic was used. The short-term FCF projections were based on the three-year financial information (Table 8). The following table contains a reference to tables with the formulas used.

Reference Table – Instruction

Steps	Reference	Formulas (is applicable)
Step 1. Calculation of operating data	Table 8	1.CAGR = SQRT (Sales 2021/ Sales 2019)-1 2.% Growth = CAGR + 0,005 3.Sales 2022E = Sales 2021* (1+CAGR)
Step 2 Historical Working Capital Data	Table 9	Day Sales Outstanding = Accounts Receivable/ Sales * 365 AR 2022E= Sales 2022/ 365 * DSO (average) Net Working Capital= Total Current Assets – Total Current Liabilities
Step 3 Calculation of FCF Projection	Table 10	Sales 2022 = Sales 2022E* (1+ % Growth) FCF= EBIAT + D&A +CAPEX + NWC
Step 4 Projection of Working Capital	Table 11	Increase / Decrease of NWC = - NWC 2019-NWC 2022E
Step 5 Calculation of % of total Capitalization	Table 12	% of Total Debt = (Loans (non-current) + Lease Liabilities (non-current) + Loans (current) + Lease Liabilities (current)) / (Total Equity + Total Current Liabilities+ Total Non-current Liabilities) Next, find the average for 5 years
Step 6 Calculation of Predicted Leveraged Beta	Table 13	1. Unlevered Beta= Predicted Leveraged Beta (Peer Company) / (1+(1-Marginal Tax Rate) * (Debt/Equity)) 2. Unlevered Beta (Air Astana) = Average of Unlevered Betas of Peer Companies 3. Predicted Leveraged Beta= Unlevered Beta (Air Astana) * (1+(1-Marginal Tax Rate) * (Debt/ Equity))
Step 7 Calculation of Cost of Equity	Table 14	Cost of Equity=Risk-free rate + Market risk premium*Levered Beta + Size Premium + Country Risk Premium
Step 8 Calculation of WACC	Table 15	WACC = Debt-to-Total Cap* After tax cost of Debt+ Equity-to-Total Cap * Cost of Equity
Step 9 Exit Multiple and Perpetuity Growth Model	Table 16	Terminal Value = Terminal Year EBITDA * Multiple (EV/ EBITDA) Implied Growth Rate= (Terminal Value * WACC – Terminal Year FCF) / (Terminal Value + Terminal Year FCF)
Step 10 Present Value Estimation	Table 17	Discount Factor = 1/ (1+ WACC) ^n PV of FCF= Discount Factor * Unlevered FCF PV of Terminal Value= Discount Factor * Terminal Value
Step 11 Calculation of share price	Table 18	Enterprise Value = PV of FCF + PV of TV Implied Share Price = (Enterprise Value – Total Debt + Cash and Cash Equivalent) / № of Shares Outstanding

Table 8: Operating Data of Air Astana Group 2019-2021

Air Astana Historical Operating Data					
	Fiscal Year Ending December 31			CAGR/AVG	
(in 000 USD)	2019	2020	2021	('19 - '21)	2022E
Operating Data					
Sales	898 729	400 264	761 838	-7,9%	**701 422,3**
% Growth	N/A	-55,5%	90,3%		-7,4%
Cost of Goods Sold	489 922	235 004	371 515		200 606,5
% Sales	54,5%	58,7%	48,8%	54,0%	54,0%
Gross Profit	**408 807,0**	**165 260,0**	**390 323,0**		**500 815,8**
% Margin	45,5%	41,3%	51,2%		
Selling, General & Administrative	39 436	40 169	28 259		29 967
% Sales	4,4%	10,0%	3,7%	6,0%	6,0%
EBITDA	**160 054,0**	**31 721,0**	**214 992,0**		**470 849**
% Margin	17,8%	7,9%	28,2%		
Depreciation & Amortization	81 355	101 035	120 832		141 033,1
% Sales	9,1%	25,2%	15,9%	16,7%	16,7%
EBIT	**78 699**	**-69 314**	**94 160**		**329 815,7**
% Margin	8,8%	-17,3%	12,4%		
Taxes	**11 763**	**-22 703**	**8 831**		
Capex	443 541,0	188 954,0	137 920,0		
% Sales	49,4%	47,2%	18,1%	38,2%	

The aforementioned financial information is relevant to the income statement of the Air Astana Group. Furthermore, to estimate the free cash flows include working capital data, which is summarized in the following Table 9.

Table 9: Historical Working Capital Data of Air Astana Group 2019-2021.

Air Astana Historical Operating Data					
(in 000 USD)	Fiscal Year Ending December 31			Average	
Working Capital data	**2019**	**2020**	**2021**	**('19 - '21)**	**2022E**
Current Assets					
Accounts Receivable	33 096	10 220	14 134		18 918
Days Sales Outstanding (DSO)	13,4	9,3	6,8	9,8	
Inventory	50 001	46 371	51 555		29 298
Days Inventory Held (DIH)	37,3	72,0	50,7	53,3	
Prepaid Expenses and Other	34 475	18 432	17 722		507,28
% Sales	3,8%	4,6%	2,3%	3,6%	
Total Current Assets	**117 572,0**	**75 023,0**	**83 411,0**		**48 723**
Current Liabilities					
Accounts Payable	92 924	39 331	62 989		35 212
Days Payable Outstanding (DPO)	69,2	61,1	61,9	64,1	
Accrued Liabilities	105 331	75 645	97 970		101 656
% Sales	11,7%	18,9%	12,9%	14,5%	
Other Current Liabilities	121 611	243 349	203 881		236 357
% Sales	13,5%	60,8%	26,8%	33,7%	
Total Current Liabilities	**319 866,0**	**358 325,0**	**364 840,0**		**373 224,3**
Net Working Capital	*(202 294,0)*	*(283 302,0)*	*(281 429,0)*		*(324 500,9)*
% Sales	-22,5%	-70,8%	-36,9%		
(Increase)/Decrease in NWC	**(81 008,0)**	**1 873,0**		**-43 071,95**	

Based on these measures further Free Cash Flows were developed for the five-year period.

Table 10: FCF Projection for Air Astana Group

Projection Period for Air Astana Operating Activity						
						Margin %
(in 000 USD)	**2022**	**2023**	**2024**	**2025**	**2026**	
Operating Data						
Sales	**649 305**	**604 306**	**565 448**	**531 915**	**503 031**	
% Growth	-7,4%	-6,9%	-6,4%	-5,9%	-5,4%	28,6%
Cost of Goods Sold	185 701	172 831	161 718	152 128	143 867	
% Sales	28,6%	28,6%	28,6%	28,6%	28,6%	
Gross Profit	**463 604**	**431 475**	**403 730**	**379 788**	**359 164**	**71,4%**
% Margin	71,4%	71,4%	71,4%	71,4%	71,4%	
Selling, General & Administrative	27 740	25 818	24 158	22 725	21 491	4,3%
% Sales	4,3%	4,3%	4,3%	4,3%	4,3%	
EBITDA	**435 863**	**405 657**	**379 572**	**357 063**	**337 673**	**67,1%**
% Margin	67,1%	67,1%	67,1%	67,1%	67,1%	
Depreciation & Amortization	130 554	121 506	113 693	106 951	101 143	20,1%
% Sales	20,1%	20,1%	20,1%	20,1%	20,1%	
EBIT	**305 310**	**284 151**	**265 879**	**250 112**	**236 530**	**47,0%**
% Margin	47,0%	47,0%	47,0%	47,0%	47,0%	
Taxes (29,7%)	7 527	7 005	6 555	6 166	5 831	1,2%
EBIAT	**297 783**	**277 146**	**259 325**	**243 946**	**230 699**	
Plus: D&A	130 554	121 506	113 693	106 951	101 143	
Less: Capex	248 171	230 972	216 120	203 303	192 263	
Less:ΔNWC	(331570)	(490)	(423)	(365)	(314)	
Free Cash Flow	**344 937**	**629 134**	**588 714**	**553 835**	**523 791**	

In addition, it is necessary to consider the development of the future Working Capital trends, which are demonstrated in the following Table 11:

Table 11: Project Working Capital of Air Astana Group

Projection Period for Air Astana Working Capital					
(in 000 USD)					
Working Capital data	2022	2023	2024	2025	2026
Current Assets					
Accounts Receivable	14 943	13 907	13 013	12 241	11 577
Days Sales Outstanding (DSO)	8,4	8,4	8,4	8,4	8,4
Inventory	4 274	3 977	3 722	3 501	3 311
Days Inventory Held (DIH)	8,4	8,4	8,4	8,4	8,4
Prepaid Expenses and Other	14 934	13 899	13 005	12 234	11 570
% Sales	2,3%	2,3%	2,3%	2,3%	2,3%
Total Current Assets	**34 151**	**31 784**	**29 740**	**27 976**	**26 457**
Current Liabilities					
Accounts Payable	25 133,2	23 391,4	21 887,3	20 589,3	19 471,3
Days Payable Outstanding (DPO)	49,4	49,4	49,4	49,4	49,4
Accrued Liabilities	1 298,6	1 208,6	1 130,9	1 063,8	1 006,1
% Sales	0,2%	0,2%	0,2%	0,2%	0,2%
Other Current Liabilities	649,3	604,3	565,4	531,9	503,0
% Sales	0,1%	0,1%	0,1%	0,1%	0,1%
Total Current Liabilities	**27 081,1**	**25 204,3**	**23 583,6**	**22 185,1**	**20 980,4**
Net Working Capital	**7 069,4**	**6 579,5**	**6 156,4**	**5 791,3**	**5 476,9**
% Sales	1,1%	1,1%	1,1%	1,1%	1,1%
(Increase)/Decrease in NWC	**(331570)**	**(490)**	**(423)**	**(365)**	**(314)**

While the cash flow estimations were made, the next step is to find the Weighted Average Cost of Capital. In doing so, the following information from the financial statements of Air Astana Group were used:

Table 12: Main Financial Information

	Amount	% of total Capitalization	Maturity
Cash and Cash Equival	226 357		
Total Debt	789 179,00	92,50%	
Shareholders' Equity	63 974	7,50%	
Total Capitalization	853 153,00	100,00%	
Net Debt	562 822		

Based on the financial above, the weighted average Betas of the peer companies were developed:

Table 13: Comparable Companies Unlevered beta

Comparable Companies Unlevered Beta *in thousands USD*	Predicted Levereged Beta	Market Value of Debt	Market Value of Equity	Debt - to- Equity	Marginal Tax rate	Unlevered Beta
Aeroflot	0,744	733 935,60	67 036,3	113, 20%	20,00%	0,39
American Airlines	1,54	33 415,20	10 124	108,96%	25,00%	0,85
China Souther Airlines	1,1	134 271,00	574 213	79,01%	25,00%	0,69
Singapore Airlines	0,834	12 987,09	17 063	53,15%	17,00%	0,58
Turkish Airlines	0,748	12 987,09	189 888	52,15%	23,00	0,53
Mean	0,99					0,61
Median	0,834					0,58
Target Company (Relevered beta)	0,92	64,70%	35,30%	64,70%	20,00%	0,61

The projected cost of equity was computed using the Capital Asset Pricing Model in the way shown below:

Table 14: Cost of Equity

Cost of Equity	
Risk-free rate	3,39%
Market Risk premium	9,23%
Levered Beta	0,92
Country risk premium	3,29%
Size Premium	0%
Cost of Equity	15,19%

The next, it the WACC was derived from the following inputs

Table 15: WACC Calculation

WACC Calculation	
Target Capital Structure	
Debt/ Total Cap	64,70%
Equity/ Total Cap	35,30%
Cost of Debt	7,73%
Tax Rate	20,00%
After tax cost of Debt	6,18%
Cost of Equity	15,19%
WACC	9,4%

Furthermore, the next step was to calculate Exit Multiple Method and Perpetuity Growth Models, which are summarized on the following Table 16:

Table 16: Exit Multiple and Perpetuity Growth Model

Exit Multiple Method	
(in thousands USD)	
Terminal Value using EMM	
Terminal Year EBITDA (2026E)	337 673
Exit Multiple	8,43
Terminal Value	2 845 422
Implied Perpetuity Growth Rate	
Terminal Year FCF (2026E)	523 791
Discount Rate	9,4%
Terminal Value	2 845 422
Implied Growth Rate	-7,64%

Perpetuity Growth Model	
(in thousands USD)	
Terminal Value using PGM	
Terminal Year FCF (2026E)	523791
WACC	9,4%
Perpetuity Growth Rate	-7,6%
Terminal Value	2 845 422
Implied Exit Multiple	
Terminal Value	2 845 422
Terminal Year EBITDA (2021E)	337 673
WACC	9,4%
Implied Exit Multiple	8,43

After calculation of the Exit Multiple Model and Perpetuity Growth model, the obtained information was used to measure the discounted cash flows:

Table 17: Present Value Estimation

Present Value and Determine Valuation							
(in thousands USD)							
		Projection Period					
		2022	2023	2024	2025	2026	
Unlevered FCF		344 937	629 134	588 714	553 835	523 791	
WACC	9,4%						
Discount Factor		0,91	0,84	0,76	0,70	0,64	
Present Value of FCF		315 405	526 018	450 081	387 164	334 812	
PV of Terminal Value (EMM)							1 818 821

Finally, the enterprise value as well as implied share prices were calculated by combining all the variables above:

Enterprise Value	
PV of FCF	2 013 480
PV of TV	1 818 821
% of EV	47,5%
Enterprise Value	3 832 301

Implied Equity Value and Share Price	
EV	3 832 301
Minus: Total Debt	789 179
Minus: Preferred Securities	0
Minus: Non-controlling Interest	0
Plus: Cash and Equivalent	226 357
Implied Equity Value	4 847 837
Number of shares outstanding	1 700 000
Implied share price	$2,85

According to the income-based valuation approach, the implied share price was way lower and equaled to 2.85 USD or 1 273.3 KZT per share. However, the application of the long-term FCFs based on the alternative forecasting method revealed that the implied share price of the company was equal to 23.08 USD or 10 311.91 KZT per share (1 USD= 446.79 KZT) (National Bank Currency, 06.04.2023). Therefore, it leads to the conclusion that the income-based valuation approach's effectiveness depends on the future cash flow forecasting assumptions as well as techniques used to measure the future inflows.

Conclusion

In conclusion, the current research work was intended to prepare the financial evaluation of the Air Astana Group and evaluate an enterprise value by applying income-based and market-based valuation approaches. According to the findings, the market-based approach has provided with more benchmark-based results. There, the financial performance as well as enterprise value were derived from the evaluation of the peer companies including Singapore Airlines, Aeroflot, China Southern Company, American Airlines and Turkish Airlines representing various markets. Based on the market-based valuation approach, the implied share price was equal to 7.05 USD or 3 149.86 KZT per share (1 USD= 446.79 KZT) (National Bank Currency, 06.04.2023). On the other hand, income-based valuation approach was based on the future cash flows that were forecasted by direct linear methods and alternative approach based on the estimation of the revenue/passenger rates. The results were distinct. For instance, the implied share price based on the linear and short-term cash flows was equal to 2.85 USD per share. On the other hand, long-term future cash flows for ten-year period provided with the implied share price 23.08 USD or 10 311.91 KZT per share (1 USD= 446.79 KZT) (National Bank Currency, 06.04.2023). Considering the obtained results on the price of Air Astana shares can be concluded that the price per share of 2.85 USD, is the closest to reality since the linear method in the income-based approach is more acceptable and has the least limitations and shortcomings. For example, the share price obtained by the market-based approach is less realistic, due to the fact that the selected companies for comparison exceed in cash turnover Air Astana. As for the long-term cash flow based on passenger traffic data, it is worth adding that Air Astana Group practices a system of flexible prices for flights, respectively, this makes the forecast less precise. Also, the aviation industry market is unpredictable and very sensitive to external factors, so a short-term forecast is more likely than a long-term forecast to coincide with real data in the future.

Based on all the results Air Astana JSC is worth investing in, as the company continues to develop and increases the number of flights, respectively, and the demand and the price per share will grow. Also, the company is just recovering from the covid period. In addition, referring to the words of the former chairman of Samruk-Kazyna, Satkaliev Almasadam Maidanovich, Air Astana is one of the most prepared subsidiaries of Samruk-Kazyna for the IPO (inform.kz, 2022).

Potential Limitations and Future Research Implications

Potential Limitations

The current research project focused on the application of the internationally accepted methods of an enterprise valuation. However, the work is not free from the potential limitations that have to be addressed by the research team. Therefore, the following are potential limitations as per authors' opinions and observations: The market-based valuation approach considered the companies with turnover and operations several times higher than the target company. In other words, selected companies for developing market-based valuation were way larger than Air Astana, which influenced on the multiple indicators. The key challenge experienced in appropriate companies was finding the companies with similar size, nature of operations and fleet size as such companies are not quoted on the stock markets.

Second potential limitation was related to the retrospective nature of the cash flow projections made in income-based valuation approach. In fact, airline company is highly influenced by the international business environment and quite often retrospective forecasts may not be applicable to predict the future patterns of the financial performance of the Air Astana. Thirdly, the industry specifics and characteristics had to be addressed in order to obtain more realistic picture of the risk-return tradeoff. Comprehensive analysis of industrial specifics would have provided with useful information about the additional sources of risks that have to be taken into account in discounting. The limitations discussed above represent a ground for a series of further in detail research related to the topic of IPO experience within airline industry.

Future Research Implications

It is necessary to address the future research implications arising from current diploma project. The following implications are made:

1. The future research work should be based on the mixed research methodology to include not only financial valuation of a company, but also the analysis of IPO prospects, press releases as well as interviews from the top management in order to gain complete information.

2. Secondly, the future research works shall be based on the incorporation of the potential risks associated with IPO proceedings as well as benefits. The analysis of the potential risks will provide with the information about post-IPO performance outlook of the companies.

3. Thirdly, it would be quite interesting to incorporate information about the current landscape of IPO and financial market development, investment activities through comparison of the IPO processes in Kazakhstan with the ones conducted in developed markets such as the United States or United Kingdom. This would provide with beneficial information in determining the differences as well as challenges the companies experience by undertaking IPO.

REFERENCES

1. AirAstana.com (2021). The Annual Report 2021.
2. https://airastana.com/Portals/2/About-Us/Corporate-Governance/Annual-Reports/2021%20annual%20report/Air%20Astana%20AR21_ENG_WEB.pdf?ver=2022-07-19-080227-910
3. AirAstana.com (2022). The Annual Financial Statements 2022.
4. https://airastana.com/Portals/2/About-Us/Corporate-Governance/Financial-Statements/FS_AA_USD_2022_signed_with_remark%20(2).pdf
5. Bartlett P. (2022). Kazakhstan's Air Astana flies above pandemic turbulence.
6. https://asia.nikkei.com/Editor-s-Picks/Interview/Kazakhstan-s-Air-Astana-flies-above-pandemic-turbulence
7. Business Information Centre kapital.kz (2022). What is an IPO and how to make money from it?
8. https://kapital.kz/finance/109532/chto-takoye-ipo-i-kak-na-nem-zarabotat.html
9. DeCress A. (2021). Part 3: Understanding Your Business Valuation–Approaches and Discounts.
10. https://www.marcumllp.com/insights/understanding-your-business-valuation-approaches-and-discounts#:~:text=There%20are%20three%20approaches%20to,employ%20in%20valuing%20the%20business.
11. Deev O. (2011). Methods of bank valuation: a critical overview. Financial Assets and Investing, pp.33-34.
12. Fernando J. (2020). Market Approach: Definition and How It Works to Value an Asset.
13. https://www.investopedia.com/terms/m/market-approach.asp
14. Goh C. F., Rasli, A., Dziekonski K. & Khan S. U. R. (2015). Market-based Valuation Multiples:
15. Evidence from Agribusiness Sector. Pertanika Journal of Social Sciences & Humanities, 23(1).
16. Gordon J. (2022). Income-Based Valuation Methods-Explained.
17. https://thebusinessprofessor.com/en_US/business-personal-finance-valuation/income-based-valuation-approaches
18. Hayes A. (2023). Valuing a Company: Business Valuation Defined with 6 methods.
19. https://www.investopedia.com/terms/b/business-valuation.asp
20. Holton G. A. (2004). Defining risk. Financial analysts journal, 60(6), pp.19-25.
21. IATA.org. (2023). The Global Jet Fuel Price Outlook.
22. https://www.iata.org/en/publications/economics/fuel-monitor/
23. Kanbekova G. (2013). Peculiarities of using the net asset method in business valuation.
24. https://scienceforum.ru/2013/article/2013007007
25. Kassymova A., (2022). Air Astana's IPO postponed.
26. https://www.inform.kz/ru/vyhod-na-ipo-eyr-astany-perenositsya_a3949189/amp
27. Kiss A. (2015). Implementation of corporate valuation techniques in practice.
28. National Bank Currency (2023). Retrieved from April 6, 2023.
29. https://nationalbank.kz/ru/exchangerates/ezhednevnye-oficialnye-rynochnye-kursy-valyut/report?rates%5B%5D=5&beginDate=2023-03-01&endDate=2023-04-30
30. Sean R. Saari (2017). The Income Approach to Valuation – Discounted Cash Flow Method. https://www.marcumllp.com/insights/the-income-approach-to-valuation-discounted-cash-flow-method

31. Shrieves R. E. & Wachowicz Jr J. M. (2001). Free cash flow (FCF), economic value added (EVA™) and net present value (NPV): a reconciliation of variations of discounted-cash-flow (DCF) valuation. The engineering economist, 46(1), pp.33-52.
32. Schmidt J. (2023). Three Financial Statements. https://corporatefinanceinstitute.com/resources/accounting/three-financial-statements/

Impact of General Economic Indicators on Net Migration of the Central Asian Countries and Russia During 2000-2021

Tolganay Aitkali, Dinara Mamatayeva, Aruzhan Temirbulatova

Abstract

This paper aims to provide an academic analysis of the Impact of general economic indicators on Net migration of the Central Asian countries and Russia. It examines fixed and random effects models by using panel data which includes various factors that might affect people's motivation to migrate, such as political stability, economic growth (GDP), corruption and others. The research draws on scholarly sources, government reports, and statistical data to present an objective assessment of the migration trends in Central Asian countries and Russia. We found out that none of the tested factors potentially affecting migration flows between these countries is statistically or economically significant. This suggests that officially reported migration flows likely do not reflect the true (possibly illegal) migration flows and more research is needed.

Introduction

Migration nowadays is a complicated phenomenon that is influenced by a variety of factors, including economic, social, and political conditions. Central Asian countries and Russia have experienced significant migration flows in recent years, with many people leaving their home countries in search of better economic opportunities. Despite making up a small portion of the world's total migrant population, migrant workers have a significant impact on the economy of Central Asia. The highest ratio of remittances to GDP is in Tajikistan. Remittance inflows to GDP in Tajikistan were reported at 26.88 % in 2020, according to the World Bank Collection of development indicators (2020), whereas Kyrgyzstan received nearly $2 billion in remittances, equivalent to 30.4% of GDP. Taking into account the advantages as well as disadvantages of migration itself, it can be seen that, on the one hand, it contributes to population growth, covers the labour shortage, and also replenishes the country's budget. On the other hand, it creates competition and tension in the labour market, which can exacerbate social tensions, thereby affecting the economy. This research aims to examine the impact of general economic indicators on net migration in these regions over the period from 2000 to 2021. The study will investigate the relationship between economic growth, unemployment rates, inflation, and other economic indicators with the net migration of the population, to identify the main drivers of migration flows in these regions.

One of the reasons for selecting these countries is that all Central Asian countries tend to create relatively attractive conditions for foreign investments, which should help them integrate into the global economy. The main goal of this thesis is to evaluate the effect of net migration on GDP, human capital, investments and trade of the Central Asian countries and Russia. The research consists of panel data with implementing causal study research within the countries selected. By understanding the economic factors that influence migration, policymakers can develop more effective measures to control migrant flows and advance economic growth by understanding the economic issues that affect migration and promote economic development in these regions.

The following research questions were aroused to analyze the migration topic:

1. How migration in Central Asian countries has been impacted by economic indicators over the past 21 years?

2. How significant are indicators such as the political stability index or corruption control index indicating patterns of migration over the past 21 years?

The following hypotheses were proposed for this study:

1) main drivers of emigration are low

GDP, rising inflation and unemployment in the origin country (push factors); 2) comparatively better life and work conditions abroad determine the decision of immigration (pull factors); 3) political stability and corruption indexes are less important than economic factors in motivating migration and choosing the destination to relocate.

Literature Review

The subject of migration holds paramount importance within Central Asian countries and Russia, which have experienced notable changes in its demography over the recent decades owing to political, economic, and environmental factors with millions of people moving within the region and to other countries annually. Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan are the five former Soviet nations that makeup Central Asia. History, culture, geographic location, and a variety of other factors, which are commonly shared between those five countries, have influenced patterns of migration and the challenges associated with them.

The purpose of this literature review is to provide a comprehensive overview of research on how the economic indicators and people's life affect migration across Central Asian nations and Russia.

The information regarding "net migration" was obtained from the official website of The World Bank from 1990-2020. Independent variables i.e. economic growth, inflation, unemployment rate, government spending and others were taken from a web page called The Global Economy.

According to Hass (2007), migration and remittances contribute to the growing economic imbalance between the wealthy and the poor. According to some scholars, moving across national borders might have an impact on the familial structure of the individual's home country (Hayes, 1991). They claim that remittance monies sent by expats may not be a consistent source of income (Hass, 2007). The recent economic issues have resulted in a 50% decrease in remittance inflows to Kyrgyzstan and Tajikistan. This figure is significant because it highlights the significant amount of these countries' total economic revenues received from remittances, which account for around 27-30% of their entire revenue.

The official website of the Kazakhstan office of the International Organization for Migration

(IOM) provides access to a wide range of scholarly papers and analytical materials about migratory patterns in the Central Asian region, with a specific focus on Kazakhstan. The IOM experts delve into various aspects of migration, such as the protection of vulnerable migrants, youth migration, return migration, and the challenges associated with unregulated migration. Furthermore, the Committee on Statistics of the Ministry of National Economy offers compilations, bulletins, and dynamic tables that serve as valuable statistical sources on migration in Kazakhstan. These data sources offer comprehensive information categorized by gender, age, ethnicity, and geographical location within Kazakhstan, encompassing both domestic and international migration phenomena.

Definition of net migration

Net migration refers to the difference between the number of people immigrating to a particular place and the number of people emigrating from that same place over a given period (Eurostat Glossary: Migration - Statistics Explained). This can be measured at different scales, such as at the national, regional or local level. Net migration is an important demographic indicator, as it can have significant economic, social and political implications. According to the United Nations Department of Economic and Social Affairs (UNDESA), net migration is a key component of population change, along with natural increase (births minus deaths). Net migration can contribute to population growth or decline, depending on whether the number of immigrants exceeds or falls short of the number of emigrants. Net migration can also affect the age structure, cultural diversity and workforce characteristics of a population, among other factors.

Relevance of chosen indicators

During migration economic and political indicators might be crucial both ways for immigrants and emigrants as well. People may decide to migrate in quest of better economic prospects, to flee political unrest, war, or persecution in their home country, or for any number of other reasons. Economic indicators like the unemployment rate, average household income, and cost of living can give valuable information about the

employment situation and cost of living in various regions or nations. People may decide to move to regions with lower unemployment rates and higher average wages or to regions with more affordable living expenses. Political and economic issues were chosen for this study because they are the cornerstones of human survival and development. According to more current research and analysis examining the linkages between the 17 Sustainable Development Goals (Fonseca et al., 2020), SDG 16 which states for peace, justice, and strong institutions and SDG 8 (decent work and economic growth) are strongly positively correlated. These links extend beyond growth and may be seen in other areas of development; traditionally, countries with higher levels of peace and stability have outperformed those that are experiencing conflict in terms of reducing poverty. Political indicators including political stability, the likelihood of civil disturbance or violence, and the degree of public corruption can all play a significant role in a person's decision to immigrate. Migration to regions with more stable political climates and lower danger of violence or persecution is a possibility. Other factors, such as the availability of social, medical, and educational services, may also have an impact on migration choices since people may move to places with easier access to these services. Individuals and families may take into account a variety of reasons before deciding to relocate, and in general, economic and political indicators can have a considerable impact on this decision. Thus, there is broad agreement that peace and security are crucial components in building

circumstances that enable countries to succeed, even though they are undoubtedly not the sole factors that support economic growth and development. For instance, recent research from the Institute for Economics and Peace (2020) shows that less peaceful nations not only face greater economic volatility but are also linked to subpar macroeconomic performance. In fact, during the past 60 years, countries with high levels of peace have had per capita GDP growth that is over three times larger than that of less peaceful nations. Since the data for the study were collected during the aforementioned period, this section of the study will disclose the economic and political state of the nation by the end of 2021. As a result, you can learn more about how things are in a given nation and what draws immigrants or causes emigrants to leave. Other empirical studies on the connections between prosperity and peace by Ho and Dinov (2013) have discovered that peace not only creates a "suitable environment" for prosperity but also has a "mechanical" impact on nations' prosperity, with a definite positive relationship between peace and prosperity. An Overview of the Political and economic situation in Central Asian Countries and Russia Since the data for the study were collected during the aforementioned period, this section of the study will disclose the economic and political state of the countries under consideration by the end of 2021. This analysis attempts to shed a light on what might draw immigrants or causes emigrants to leave. Kazakhstan's economy has grown steadily in recent years, as a consequence of the country's

Kazakhstan

Economic situation	Political situation
economic challenges, including corruption, a relatively high poverty rate, and a need to further diversify its economy	restrictions on political freedom, and freedom of expression (human right Watch, 2022)
53rd place in the list of largest economic growth rates (nominal GDP,2022)	Democratic Deficits The political landscape is dominated by a single party, limiting political pluralism and opposition representation

plentiful natural resources, particularly its oil and gas reserves. Economic reforms have been implemented in the country to diversify the economy, encourage investment, and improve business environments. These initiatives have resulted in more job opportunities, particularly in manufacturing, finance, and information technology (IT). According to studies, the country's economic prospects are enticing to immigrants seeking better job opportunities and income stability. Political stability is an important factor for prospective immigrants because it ensures a safe and predictable environment. Since gaining independence, Kazakhstan has maintained a stable political climate, avoiding major political upheavals or conflicts.

Russia

Economic situation	Political situation
11th place in the list of largest economic growth rate (GDP)	Authoritarian government, superior influence and control of government officials and politicians
The constant decrease in the unemployment rate	Limited freedom of speech and political opposition (Human Right Watch)
Economic inequality and significant corruption incidents (Statista Research Department)	World's largest stock of nuclear weapons and leading weapon manufacturer

Based on the brief information in the table above, it can be inferred that, in comparison to the other Central Asian nations, the economic situation in Russia likely appeals to immigrants more. However, the political situation in the country is extremely unstable and even threatening, taking into account the events of 2022. According to the UN DESA ranking of the top 20 destinations and origins of international migrants in 2020, The Russian Federation ranks fourth as a host country after the United States, Germany, and Saudi Arabia. Given the relatively small proportion of the population living in Russia and Central Asia combined (3%) in the world population, such statistics are quite significant. This means that despite the country's unsteady political climate, people are still interested in Russia due to the country's growing economy and the possibility of finding a job with better pay and living conditions.

Kyrgyzstan

Economic situation	Political situation
High dependence on international investments	Unstable governmental and political structure
Heavily dependent upon the inflow of remittances from its migrant workforce	Lack of freedom of speech for positioners
Increase in the unemployment rate because of COVID	Corrupted and biased government

Kyrgyzstan, like other landlocked countries in Central Asia, relies significantly on remittances from labour migrants and exports of gold, agricultural products, and clothing to sustain a significant portion of its budget. The COVID-19 pandemic had negative effects on the country, resulting in a decrease in both remittances from labour migrants and export revenues. Economic fluctuations induced by external factors, such as volatile prices and shifts in trade dynamics, can have a considerable impact on the country's economy. In 2020, Kyrgyzstan experienced a substantial decrease in GDP by 8.6%, accompanied by an inflation rate of 8.5%. Many businesses were forced to close due to pandemic-related restrictions, increasing unemployment. To alleviate the economic damage, the government has introduced measures such as tax breaks for small firms and increased spending on healthcare and social welfare programs. Kyrgyzstan's future path remains unpredictable, notably in terms of politics and the economy. While the government may contribute to progress, considerable obstacles remain that will require time, financial resources, and rigorous efforts to overcome.

Uzbekistan

Economic situation	Political situation
Economy growth is based on the agricultural and natural resources sector	Migration governance development
Economic reforms aimed at attracting foreign investment	Corruption and human rights violations

The economy of the Republic of Uzbekistan is heavily reliant on its agriculture industry and natural resources. To liberalize the economy, draw in foreign investment, and lessen state control over economic activities, the Uzbekistani government has adopted reforms recently. Foreign investment and economic growth have surged as a result of these reforms, particularly in the textile and energy industries. In general high levels of corruption, poor infrastructure, and a lack of economic diversification remain problems for the nation. As of the end of 2021, the Governance of Uzbekistan has implemented significant political reforms, such as easing restrictions on political opposition and media freedom, releasing political prisoners, and improving relations with neighbouring countries. According to the migration governance profile of Uzbekistan from Migration Data Portal (2023), as measured by the rights of migrants, a "whole-of-government" approach, partnerships, socioeconomic well-being of migrants, the mobility dimensions of crises, and safe and orderly migration, there are well-developed migration governance structures and areas with potential for further development. However, detractors contend that there is still little room for political dissent and criticism because the nation's political structure is still largely centralized. The nation also has to contend with security issues like terrorism and drug trafficking, especially in its border regions.

Uzbekistan

Economic situation	Political situation
The increasing rate of inflation	Corrupted governmental structure
Depending on the remittances of migrants	Unstable economy
Low level of international investments	Dangerous neighbourhood regions

Tajikistan, a small Central Asian country, is primarily reliant on remittances from overseas employees as well as commodity exports such as aluminium and cotton. The COVID-19 pandemic had a significant influence on the economy, culminating in a 4.7% decline in 2020. As a result, the cost of necessary goods and services has risen significantly, making it difficult for households to meet their necessities. In 2020, the country's inflation rate was 11.9%. In response to the pandemic, the government has taken economic measures such as tax reductions for enterprises and financial support to needy families. However, hurdles to growth and transformation exist throughout the country. These issues are exacerbated by the absence of private firms and little foreign investment. Political difficulties such as civil rights constraints, corruption, and a lack of transparency impede company progress and dissuade potential investors. Tajikistan faces security problems as a result of its proximity to Afghanistan and the presence of extremist groups in the region. Recent reports show a rise in terrorist activity, notably along the eastern border with Afghanistan. Addressing these significant difficulties and improving governance is critical for the country's future progress.

Turkmenistan

Economic situation	Political situation
the country is heavily reliant on its natural gas reserves, which account for the majority of its export earnings	a presidential republic with a strong authoritarian government
economic growth and investment have been hampered by restrictions on private enterprise and foreign investment	limitations on political opposition and independent media
one of the top ten cotton producers in the world, with cotton accounting for roughly half of all irrigated land	Democratic Party of Turkmenistan is the only legal political party

Turkmenistan is not typically regarded as an appealing destination for immigrants due to several factors, including limited economic opportunities, government immigration restrictions, and concerns about human rights and freedom of expression. Turkmenistan has a small population of slightly more than 6 million people, and its economy is heavily reliant on natural gas exports (World Bank, 2022). While the country has made efforts to diversify its economy and attract foreign investment, the government maintains strict control over the economy, and foreign companies face significant regulatory barriers (U.S. Department of State, 2021).

In addition to these economic challenges, Turkmenistan imposes immigration restrictions, and obtaining a work permit can be a time-consuming and complex process. The government also places limits on the types of jobs that can be held by foreigners, and non-Turkmen citizens are required to pay higher fees for many services, including medical care and education (U.S. Department of State, 2021).

Methodology of research
Panel data (or longitudinal) data is a type of data employed in statistical analysis, econometric modelling, and social science research. Panel data pertains to data that has been accumulated over some time by repeatedly observing a cohort of individuals or entities, which might be companies or nations. The panel data consists of information from both cross-sectional and time series, enabling a comprehensive analysis of both the variations within and between different groups. The benefit of panel data is that heterogeneity can be regulated in our regression model by classifying it as fixed or random. There are numerous approaches for analyzing panel data, including fixed-effect models, random-effect models, and pooled regression models. The fixed effect model estimates the relationship between the independent variables and the dependent variable while controlling for individual-specific time-invariant factors. As stated by Wooldridge, J. M. (2010) in Econometric

analysis, These time-invariant factors are treated as fixed and are incorporated as individual-specific intercepts in the regression model. The researcher can use this model to account for individual-specific features that are not seen but may be associated with both the dependent variable and the independent variables. The next type is the random effects model which takes into consideration individual-specific time-invariant characteristics that are uncorrelated with the independent variables while estimating the relationship between the independent variables and the dependent variable. These variables that change over time are considered random and are incorporated into the regression model as person-specific error terms. When the researcher considers that the independent variables and the person-specific time-invariant components are uncorrelated, this model is helpful. A simple pooled OLS regression model does not consider individual- or time-specific characteristics, this model calculates the link between the independent variables and the dependent variable.

The data about net migration and the effect of different economic indicators changed over the past 20 years were collected and used in this research. With this research, we explore the correlation between the dependent variable (net migration) and independent variables (economic and political indicators).

Data analysis

The dependent variable is net migration - the migration balance which is defined as: Net migration (NM) = Immigrating population - emigrating population (Inflow - outflow) A positive migration balance denotes a country or territory where more people arrive than depart from, while a negative net migration number indicates that more people leave the country than entering it. Independent variables used in the analysis are based on information from The Global Economy, Business and Economic data sources. There is the table explaining the precise definition of each variable as well as the correlation expectation with the net migration data:

Type	Variable name	Definition	The expectation with regards to correlation to NM
Dependent	Net migration	Immigrating population - emigrating population (Inflow - outflow) if n>0 = inflow if n<0 = outflow	
Independent	Economic growth GDP	An increasing rate means the GDP grows and vice versa.	positively correlated if Growth ↑ => NM ↑
Independent	Consumption as % of GDP	The higher value of the consumption means the higher living condition for inhabitants	positively correlated if C ↑ => NM ↑
Independent	Unemployment rate	Unemployment refers to the share of the labour force that is without work but available for and seeking employment (The Global Economy, 2023).	negatively correlated if U ↑ => NM ↓
Independent	Government spending as % of GDP	This includes government purchases and social welfare payments	positively correlated if GS ↑ => NM ↑

Independent	Government effectiveness index: -2.5 weak; +2.5 strong	It captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies (The Global Economy, 2023).	positively correlated if GE ↑ => NM ↑
Independent	Control of corruption index -2.5 weak; +2.5 strong	It measures perceptions of the degree to which public power is used for private gain, taking into account both small-scale and large-scale corruption as well as the elites' and private interests' capture of the state (The Global Economy, 2023).	positively correlated if CC ↑ => NM ↑
Independent	Political stability index -2.5 weak; +2.5 strong	The Index of Political Stability measures the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means (The Global Economy, 2023).	positively correlated if PS ↑ => NM ↑
Independent	Freedom from corruption	100 = no corruption, decreasing amount means a higher corruption rate	positively correlated if FC ↑ => NM ↑
Independent	Economic freedom 0 to 100 100 – maximum freedom	It has 10 components grouped into four broad categories: Rule of Law; Limited Government; Regulatory Efficiency and Open Markets (The Global Economy, 2023).	positively correlated if EF ↑ => NM ↑

To estimate the relationship between net migration and economical-political data, the R-studio software was used. For the analysis of panel data, a variety of techniques are available, including fixed effects, random effects, and pooled simple OLS regression models.

Models	p-value	R^2	Separate p-values		Coefficients in Equation
Pooled OLS	4.578e-13	0.5122	Economic growth	0.9859	Net Migration = 161662.98
			Consumption as % of GDP	9.18e-05	- 55.18*Growth
			Unemployment rate	0.1486	- 2886.89*C
			Government spending as % of GDP`	0.0178	+ 8084.84*U
			Government effectiveness	1.05e-05	+ 8400.80*GS
			Control of corruption	0.0763	+ 199695.04*GE
			Political stability index	0.0104	- 133449.67*CC
			Freedom from corruption	0.0763	- 58315.75*PS
			Economic freedom	0.0603	+ 3242.5*FC
					- 4195*EF.
Random effect	0.41215	0.086575	Economic growth	0.1887	Net Migration = -287.23
			Consumption as % of GDP	0.6748	- 871.63*Growth
			Unemployment rate	0.4890	- 154.85*C
			Government spending as % of GDP`	0.5887	+ 2079.54*U
			Government effectiveness	0.6124	- 967.24*GS
			Control of corruption	0.1204	- 9089.94*GE
			Political stability index	0.8292	- 40531.33*CC
			Freedom from corruption	0.3395	- 2241.36*PS
			Economic freedom	0.4944	+ 649.83*FC
					+ 758.14*EF.
Fixed Effect	0.14347	0.1219	Economic growth	0.22851	Net Migration = - 1013.09*Growth
			Consumption as % of GDP	0.12848	- 424.14*C
			Unemployment rate	0.4890	+ 424.06*U
			Government spending as % of GDP`	0.85750	+ 285.74*GS
			Government effectiveness	0.8501	+ 3046.48*GE
			Control of corruption	0.0147	-54955.13*CC
			Political stability index	0.6162	+ 3980.73*PS
			Freedom from corruption	0.55301	+ 319.18*FC
			Economic freedom	0.62641	+ 418.17*EF.

The table above shows the results of each three-panel data model used in R. The second column describes summaries of the probability value (p-value) of F-statistic, meaning the joint probability of all nine independent variables fitting the data well. We can infer that at least one of the independent variables has a significant linear relationship with the dependent variable if the F-statistic is high and the corresponding p-value is low (less than 0.05 significance level). The percentage of the total variation of the dependent variable that can be explained by the independent variables is presented in the next column, which is designated as R-squared. A greater R-squared suggests that the model fits the data more accurately. The third and fourth columns are indicated for the separated p-values of each variable and their coefficients in the regression equation respectively.

First, it is needed to identify whether pooled OLS regression is suitable for this model because this model has a few conditions for choosing OLS. If at least one of the assumptions of Gauss-Markov theorems (Exogeneity, Homoscedasticity and Non-autocorrelation) is violated, then the Fixed Effect or Random Effect models are more applicable. Running the Breusch-Pagan test Heteroskedasticity assumption resulted in the output of a high test statistic (BP=47.466) and a low p-value (<0.05). We, therefore, reject the null hypothesis and conclude that the homoscedasticity

assumption is violated by this regression model. Here it can be concluded that FE or RE models are preferred to continue the analysis. The following step is to select between Fixed and Random effect models. This was accomplished by using the Hausman test. The endogeneity of the examined models is essentially demonstrated by this test. Endogeneity assumption refers to a common problem in statistical analysis where a relationship between two variables may be affected by a third, unobserved variable (Lee, 2007). In simpler terms, it means that there may be an additional factor that is influencing the relationship between the two variables we are interested in, but we are not measuring or accounting for it in our analysis. The assumption of zero covariance between independent variables and the error term is the null hypothesis. If so, FE should be avoided in favour of RE. We must use the FE model if the null hypothesis is rejected. In this situation, selecting the Fixed effect for the regression model have the best results.

Interpreting the results in the table of Fixed effect model results, the joint p-value of independent variables is equal to 0.14347 which is greater than the significance level of 5%. Thus, it is concluded that the model is statistically insignificant. There is evidence that there is no linear relationship, so variables are not statistically significant. R-squared resulted in a low percentage of 12.19% indicating the percentage of the model explained by the independent variables. Looking at the separate p-values of each indicator, there is only one significant variable with a p-value of 0.01472. Control of corruption is statistically significant and has a direct relationship with the change in Net migration, according to our results. Along with that, this result is economically meaningless, as the coefficient turned out to be negative which means that a perception of the increased control over corruption is associated with the increase in migration outflow and/ or decrease in migration inflow. The rest of the coefficients though some of them have expected signs are not statistically significant.

One possible explanation for the inconsistent results of our regressions is insufficient data points or unobserved non-recorded illegal immigration flows between the countries under analysis. Another possible explanation is that the tested factors indeed do not explain the migration flows between these countries and more research is needed.

Conclusion

Summarizing the research project on net migration of the population of five Central Asian countries and Russia, the result is based on research data with linear regression indicating that there is no connection between basic economic and political data with the net migration flow. This conclusion serves as the foundation for disproving the initially anticipated theories that the primary driving forces are the relative political stability and economic allure of other nations. The chance that people from Central Asia will not have sufficient resources to relocate to a country with living circumstances comparable to those in their home countries, however, is raised by such a conclusion. There is an interesting finding that the low control of corruption by the government is statistically significant for the outflow of the population and vice versa. It can be concluded that political indicators are somewhat more important in choosing the destination of living. Additionally, it is reasonable to believe that such a conclusion could result from a lack of official data, a lack of indicators, or the population's majority of illegal immigration. The above-mentioned finding might have the path for fresh, original research projects in the future.

Bibliography

1. Fonseca, L. M., Domingues, J. P., & Dima, A. M. (2020). Mapping the Sustainable Development Goals relationships. Sustainability, 12(8), 3359.

2. Freedom House. (2021). Turkmenistan. Retrieved from https://freedomhouse.org/country/turkmenistan/freedom-world/2021

3. Glossary: Migration - Statistics Explained. (n.d.). Glossary: Migration - Statistics Explained. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Migration#:~:text=Emigrant%20is%20a%20person%20undertaking,and%20the%20number%20of%20emigrants.

4. Human Rights Watch. (2022, January 13). Russia: Bleak year for human rights. Retrieved from https://www.hrw.org/news/2022/01/13/russia-bleak-year-human-rights

5. International Organization for Migration. (2022). World migration report 2022. Geneva, Switzerland: IOM. Retrieved from https://www.iom.int/

wmr/world-migration-report-2022

6. Institute for Economics and Peace. (2020). Global Peace Index 2020: Measuring peace in a complex world. Sydney. Retrieved from https://www.visionofhumanity.org/wp-content/uploads/2020/10/GPI_2020_web.pdf

7. Marat, E. (2009). Labour migration in Central Asia: Impacts and potential solutions. Silk Road Papers, 9.

8. Migration Data Portal. (2023). Migration Governance Indicators Profile 2022 | Republic of Uzbekistan. Retrieved from: Migration Governance Indicators Profile 2022 | Republic of Uzbekistan | IOM Publications Platform

9. Statista. (n.d.). Population living in Poverty Russia 2022. Retrieved from https://www.statista.com/statistics/1318347/population-living-in-poverty-in-russia/

10. The Global Economy. (n.d.). Compare countries with annual data from official sources. Retrieved from https://www.theglobaleconomy.com/compare-countries/

11. United Nations Department of Economic and Social Affairs. (2019). World population prospects 2019: Highlights (ST/ESA/SER.A/423). Retrieved from https://population.un.org/wpp/Publications/Files/WPP2019_10KeyFindings.pdf

12. U.S. Department of State. (2021). Turkmenistan. Retrieved from https://www.state.gov/reports/2021-report-on-international-religious-freedom/turkmenistan/

13. World Bank. (2022). Turkmenistan. Retrieved from https://data.worldbank.org/country/turkmenistan

14. Wooldridge, J. M. (2010). Econometric analysis of cross section and panel data. MIT Press. Retrieved from: Econometric Analysis of Cross Section and Panel Data (ipcig.org)

Factors of Development of the Electric Vehicle in the EU Countries

Nurzhigit Ibatov, Karim Chinchalinov, Bayansulu Karim

Abstract

The development of electric vehicles (EVs) has become a crucial aspect of sustainable transportation systems and greenhouse gas emissions reduction strategies. This research delves into identifying and analysing factors that affect the growth of EV markets in European Union countries. The study utilizes panel data from 27 EU nations during the period between 2018 and 2021, employing pooled OLS and random effects regression models to evaluate various factors' impact on national EV sales. Independent variables used include national transport taxes, publicly accessible charging stations for electricity, average national energy prices, consumer gasoline prices, gross domestic product per capita, total land area, and population employment rates. Results suggest that these variables have varying impacts on the adoption rate of EVs across EU nations but may still be critical determinants for policymakers seeking to increase their nation's electric vehicle market share. The results show that national transport taxes, the number of publicly accessible power charging stations, gross domestic product per capita, total land area, and consumer prices of gas oil automobiles have a statistically significant impact on the development of the electric vehicle market in the EU countries, while the average national price of electrical energy and proportion of the population that is employed do not. These findings can provide valuable insights for policymakers and industry stakeholders to design effective strategies and policies to promote the adoption and development of EVs in EU countries.

Abbreviation	Description
EU	European Union
EV	Electric Vehicle
CO_2	Carbone Dioxide
EC	European Commission
HEV	Hybrid Electric vehicle
BEV	Battery electric vehicle
AEV	All electric vehicle
PHEV	Plug-in Hybrid electric vehicle
PEEV	Range-extended electric vehicle

Introduction

The transportation industry is a significant contributor to the amount of greenhouse gas emissions that are produced. In fact, 'it is responsible for a staggering 25.8% of the total CO_2 emissions in the EU alone. As such, the EU has committed to implementing a net-zero transition by 2050 as part of its ratification of the Paris Agreement on November 4th, 2016. However, this ambitious goal can only be reached if there are fundamental changes made to the transport system, which necessitates creating alternative fuel vehicles.

The demand for road transport in Europe is growing at an alarming rate; from 1995 to 2008, the total number of passenger kilometres increased by 25%, from 3800 billion to an enormous 4800 billion kilometres covered annually. At present, cars cover about three-quarters (75%) of travel needs in Europe; trains, buses, planes, and ships handle the remaining one-quarter (25%). Europe's dependence on fossil fuels - particularly dominated by road transport - poses a serious downside concerning oil dependence and greenhouse gas emissions.

Europe's increasing reliance on crude oil consumption due to higher demand for road transportation means that any progress made in efficiency or other sectors has been offset significantly; this dependency means there is a high likelihood of interruption and disruption due to proven reserves being concentrated mainly within politically unstable regions coupled with depletion rates and growing global demands contributing towards uncertainty in oil price developments.

Mitigate these risks associated with volatile oil prices and potential future shortages caused by political instability or depletion rates requires reducing Europe's consumption levels through facilitating modal shifts towards other less oil-dependent vehicles while simultaneously promoting development initiatives aimed at producing alternative vehicle concepts and more energy-efficient vehicles powered through low-carbon sources like electromobility.

Transitioning towards low-carbon energy balance solutions faces several issues such as high car prices when it comes to electric vehicles which face significant regulatory barriers that must be overcome. Additionally, the implementation of such solutions comes with risks and trade-offs, which need to be carefully weighed up against the potential benefits. For several years now, monetary incentives have been put in place to encourage market intervention and partial elimination of these barriers but the exact stimulation effect created by these measures is currently unknown.

Despite this, sales of electric vehicles in Europe have increased significantly over recent years. However, while this growth has been strong in relative terms (compared to previous years) when taking absolute numbers into account - it remains a small market. In fact, in 2021 alone, the share of the European electric vehicle market exceeded 2.4%.

Although there are numerous studies available on electric vehicles and their development, more research needs to be done to determine the impact of government support initiatives on electric vehicle adoption rates across Europe fully. Factors such as monetary incentives and charging networks will need to be analysed carefully alongside panel data approaches before informed decisions can be made regarding the future direction of decarbonizing transport and reducing air pollution levels caused by traditional fuel-driven vehicles.

Literature review

The electric vehicle (EV) market is rapidly growing across the world, and the European Union (EU) is no exception. The EU has set ambitious climate targets and sees the transition to EVs as a crucial component in achieving those targets. In this literature review, we will explore the factors that are driving the growth of the EV market in the EU countries.

The development of the electric vehicle in the European Union (EU) countries is a complex issue influenced by various factors. Government regulations, infrastructure availability, consumer demand, and technological advancements are among some of the key drivers that have shaped the growth of electric vehicles (EVs) in these markets.

Government regulations play a significant role in promoting EV adoption in EU countries. According to Rainnie (2016), an integrated approach covering vehicle efficiency, renewable fuels as well as measures that help reduce transport demand itself is required. Many EU member states have implemented policies such as tax incentives and subsidies for EV purchases to encourage their use over traditional internal combustion engine vehicles. These policies aim

to tackle climate change by reducing greenhouse gas emissions from transportation sectors. Infrastructure availability also plays a crucial role in supporting the development of EVs across Europe. As noted by FTI Consulting LLP (2017), Electric Charging Stations or ECS's can reduce emissions associated with driving and are capable of being emission-free depending on sources utilized for electricity and hydrogen. The installation of charging stations throughout urban areas provides convenience to EV owners who need to charge their cars while away from home.

Consumer demand is another critical factor influencing the proliferation of EVs across Europe. In recent years there has been growing concern among consumers about environmental issues, leading many individuals towards more sustainable transportation options like electric cars instead; this recent trend outlined was confirmed by Geny's research earlier this year (2021). This shift has resulted in increased production volumes by automakers focused on producing environmentally friendly automobiles driven by customer preferences.

Technological advancements also shape the development process within which electronic vehicles operate today - especially Battery Technology & Software improvements according to both citations provided here (Geny 2021 & FTI Consulting LLP 2017). Currently, existent range anxiety issues may become obsolete if battery tech continues advancing at its current pace; moreover, software optimization will continue improving charging times which could lead customers toward even greater EV adoption rates.

In conclusion, the development of electric vehicles in the EU countries is influenced by various factors - government policies and regulations promoting sustainable transportation options, consumer demand for environmentally friendly cars, improvements in infrastructure availability with more ECS's being installed throughout urban areas; ending on technological advancements including those made toward software optimization and battery tech.

Overview

In recent years, many automakers have made every effort to convert conventional cars with internal combustion engines into environmentally safe and reliable electric vehicles. The market of electric vehicles in the EU is growing every day, ahead of China, which was the largest supplier of electric vehicles. In 2020, the share of electric vehicle sales was 43%, which is twice the number of sales in 2019. In the EU-27 countries, sales and consumption of electric vehicles and electric vans increased significantly in 2021. If 1,400,000 electric vehicles were registered in 2020, then in 2021 this number increased and about 2,110,000 were registered. It turns out that in just one year the share of the total number of registrations increased by 7.1% from 10.7% to 17.8%. As for electric vans, from 2020 to 2021, the share of the total number of registrations increased by 1% from 2.1% to 3.1%, as well as the number of registered battery electric vehicles and hybrid cars in 2020 is comparable to 2021, but in the case of vans, most of them were occupied by battery electric vehicles. There are three main types of electric vehicles:
1. BEV/AEV is a car that is completely dependent on battery and electricity.
2. HEV/PHEV is a hybrid car that combines an electric motor and an internal combustion engine.
3. REEV is a car that is powered by an electric motor charged by a battery.

Tax

Tax incentives are an important element in stimulating demand for electric vehicles. Taxes on purchases, rent and road tolls are important aspects that are facilitated by the government to make electric cars a more attractive alternative for buyers. Taxation depends on the date of purchase of an electric vehicle since at first owners of electric vehicles are exempt from paying taxes. Since the summer of 2018, a new law on taxes has come into force. If the electric car was registered from 05/11/2011 to 12/31/2020, the owners of electric cars are exempt from paying taxes for ten years. Also, if someone has converted their car into an electric car, then they are also exempt from paying taxes for ten years, regardless of the date of the first registration.
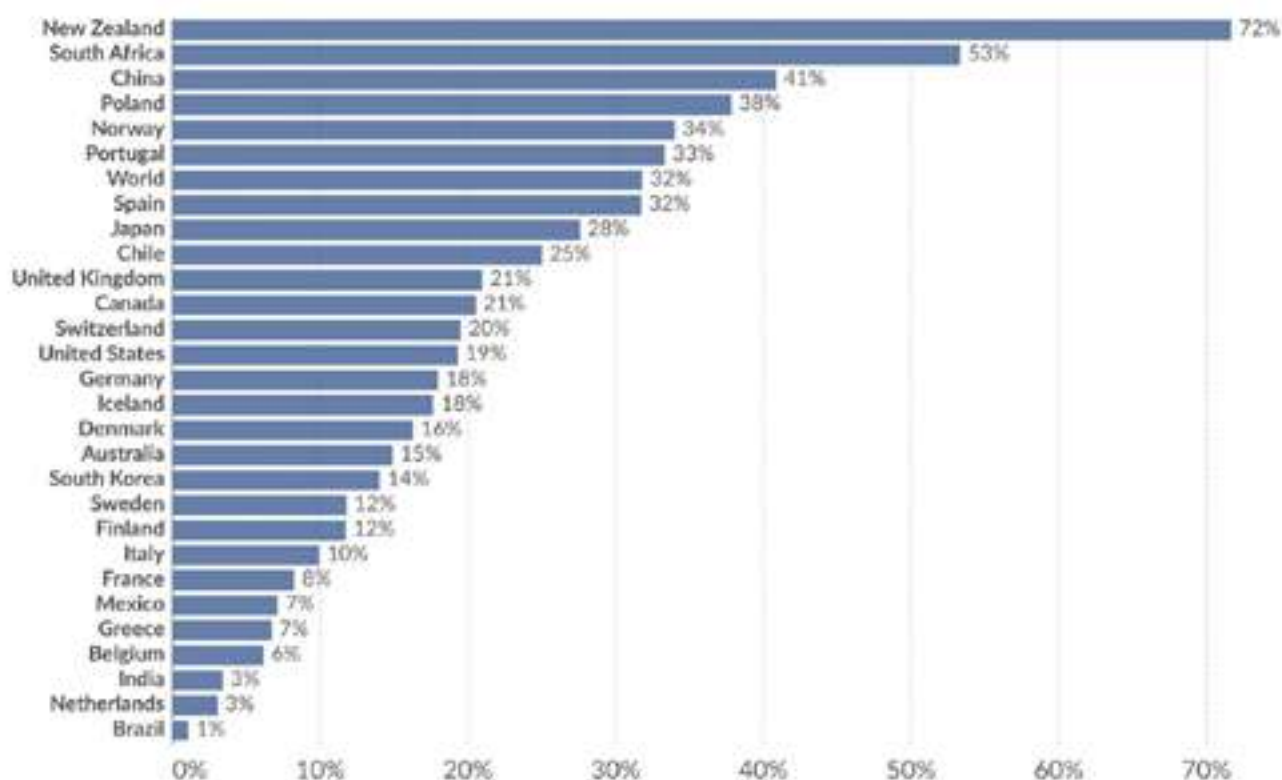
Charge

Following the growth of electric vehicles introduced into the EU countries, technologies, and infrastructure for charging them are also developing. In several EU countries, the state has taken on a major role in creating an infrastructure to which electric car drivers

can connect for charging. New technological developments that improve EV range, as well as increase the availability and speed of charging parking infrastructure, will change the need for charging infrastructure in the future. The costs of large-scale development of charging infrastructure in Europe are very large so that only the public sector can finance it (figure 1 shows charging station costs ~ 2000 euros and this is only for equipment) because one of the most important tasks for the popularization of electric vehicles is to achieve commercial viability with the development of charging infrastructure.

FIGURE 1

Share of public electric vehicle chargers, 2021

Along with the growth in sales of electric vehicles, the availability of charging stations also increased. The current introduction of charging stations falls on cities, and this complicates long-distance travel. As a rule, there are charging stations located in houses, that charge up to 22 kilowatts and supply alternating current. There are also charging stations like the Tesla Supercharger that supply direct current. Charging stations that are in the public domain also produce an alternating current of 22 kW. These charging stations are important because they are a budget way to increase the number of charging points. One 11-kilowatt station costs 700-900 euros, and a 22-kilowatt station costs around 2,000 euros. Such small charging stations are located either in private homes or directly in the city, since owners of electric vehicles need to travel a long distance beyond the outskirts and, accordingly, they need more powerful charging stations using direct current. The power in such charging stations varies from 50 to 350 kilowatts.

However, recently in Germany, it was decided to limit the charging of electric cars in private homes. For several years, German motorists will not be able to use home charging at their discretion. It will be forbidden to charge electric cars during rush hour, and they will also reduce the charging time to a couple of hours. This is done so that owners of electric vehicles use public stations directly with their tariffs.
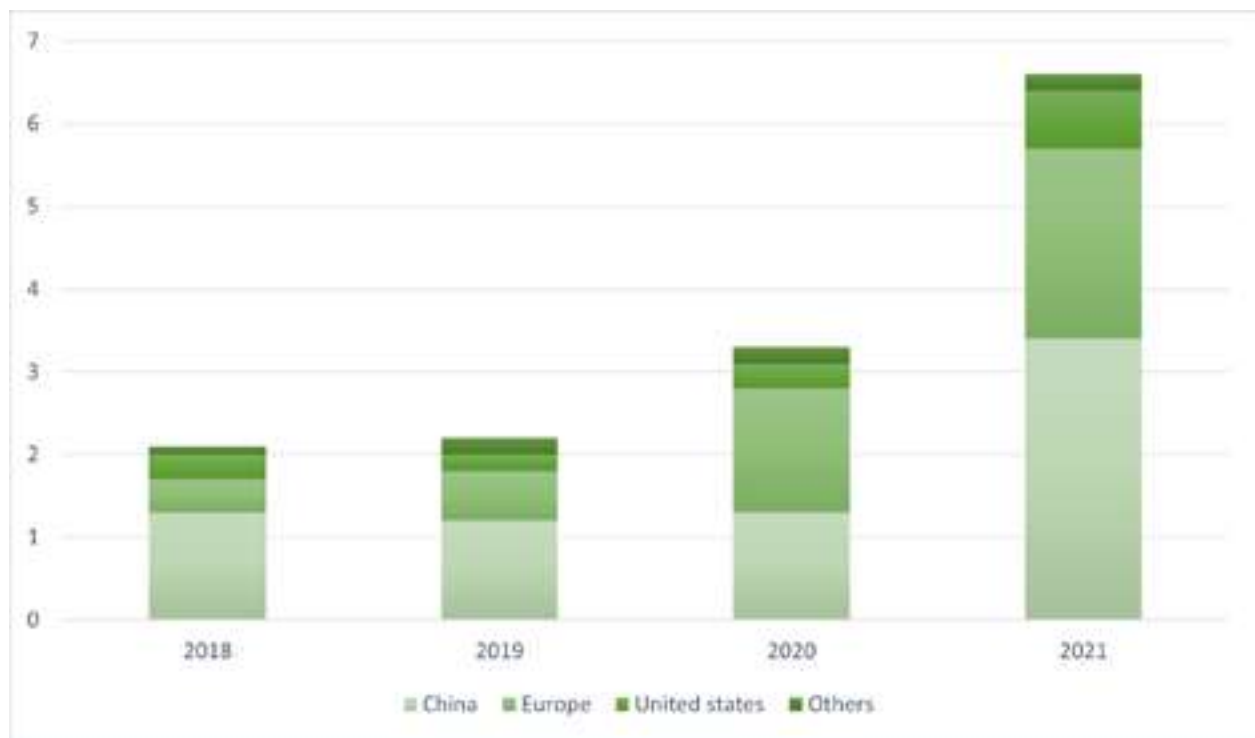
Sales. FIGURE 2. Global electric-car sales

The figure (Figure 2) shows the sales of electric vehicles in Europe from 2018 to 2021. 2021 was a particularly good year for China, as sales increased from 1.3m to 3.4m. Also in Europe, sales increased by 65% from 1.5m to 2.3m. In the US, sales do not exceed the 1 million mark and the market share of electric vehicles remains much lower than in Europe and China.

Also in 2020, production of more than 65 new electric vehicles was launched in Europe – this is twice as much as in China, and in North America, only 15 models were released in 2020. In 2021, Europe planned to release about 99 new models of electric vehicles, and North America planned to release 64 new models.
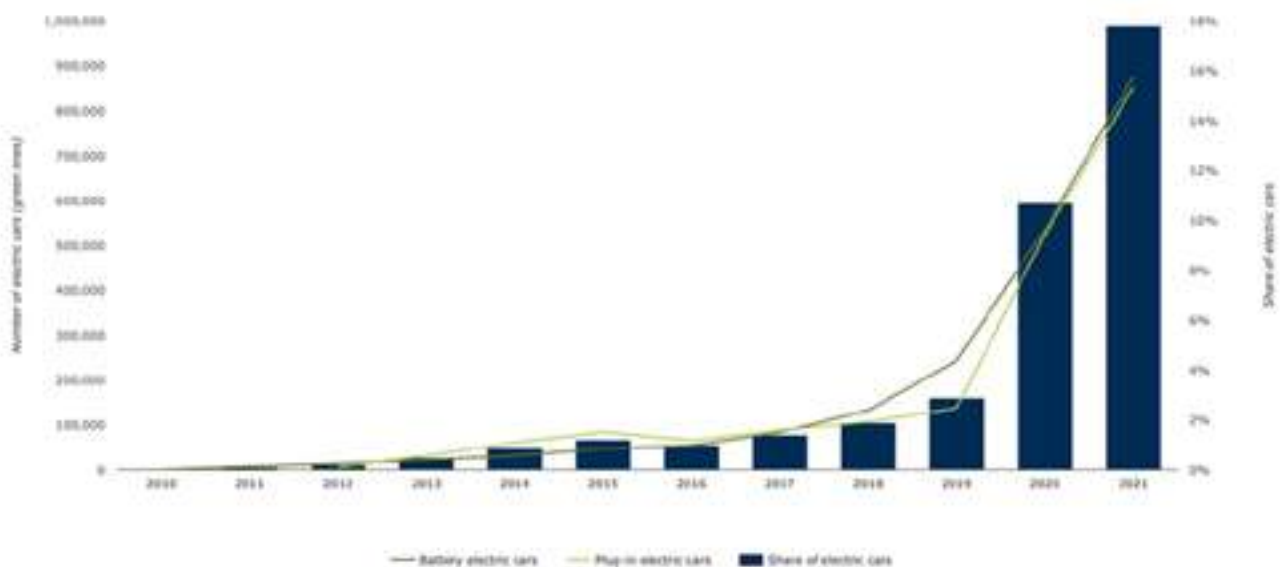
(https://www.eea.europa.eu/data-and-maps/daviz/new-electric-vehicles-in-eu-2#tab-chart_3, *n.d.*)

Year	Battery electric cars	Plug-in electric cars	Total cars	Share of electric cars
2010	591		11128785	0
2011	7179		10498868	0,1
2012	13730	6225	9369664	0,2
2013	21454	31079	9573937	0,5
2014	31197	60370	10075476	0,9
2015	46857	84115	11150601	1,2
2016	54065	65011	12027051	1
2017	83491	88334	12574590	1,4
2018	132377	106502	12753440	1,9
2019	242966	137632	12991283	2,9
2020	536186	525311	9924123	10,7
2021	876527	852440	9695706	17,8

FIGURE 3

The graph and table (Figure 3) show the number of Battery electric cars, Plug-in electric cars, the total number of electric vehicles and the share of the total number of registrations in the EU-27 countries from 2010 to 2021.
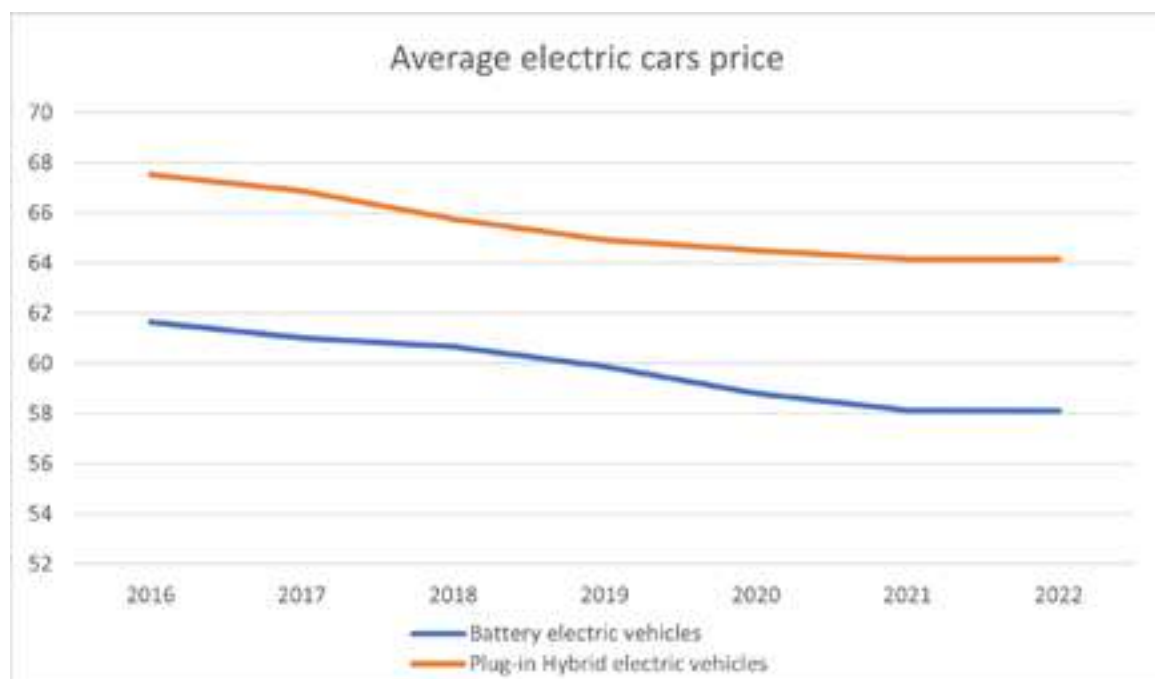
FIGURE 4

Starting from 2016 to 2022, prices for electric cars began to fall rapidly. All because of the subsidies that the state allocates and thanks to them, every European can safely buy an electric car. The governments of France and Germany are singled out, which have raised the number of subsidies to 7,000 and 9,000 euros to stimulate the market and increase sales.
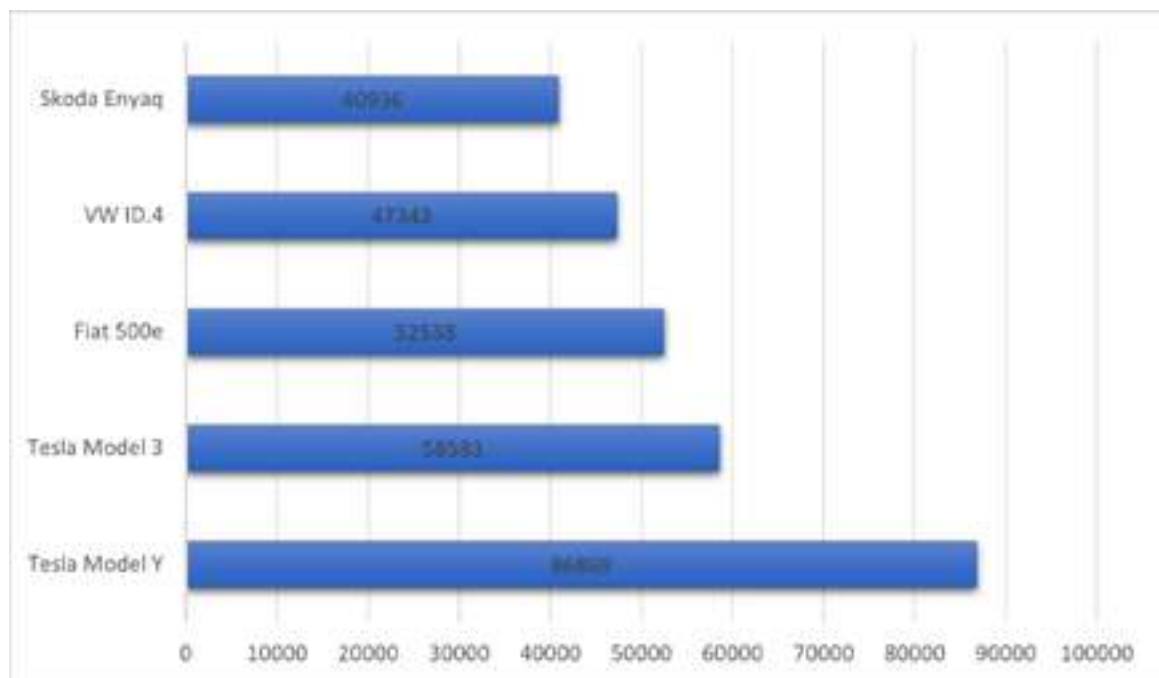
FIGURE 5. The most popular models, 2022

The most popular models of electric vehicles that were registered in 2022 (Figure 5). In the first and second places is the Tesla brand with two popular models that received 86.869 and 58.583 registrations. However, European automakers are doing everything to overtake the American automaker, and some succeed. For example, the Volkswagen ID.4 brand, which registered 6,158 electric vehicles in October 2022, became the absolute leader in Europe. Also, many Tesla manufacturers claim that such a decline in the company occurred due to logistics problems, while others believe that it happened due to the emergence of many new brands of electric vehicles in Europe. Nevertheless, Tesla is not going to slow down and is going to complete the construction of a gigafactory factory in Germany for consumers in Europe.

As for the prices for charging with electricity, we can consider this in the example of one of the popular models of electric vehicles Tesla Model 3. For 40 cents per kWh of electricity, it turns out that every 100 km of the way on the Model 3 will cost 8.32 euros, and at a speed of 160 km / h, 30 kWh of electricity will be required for 100 km of the way.
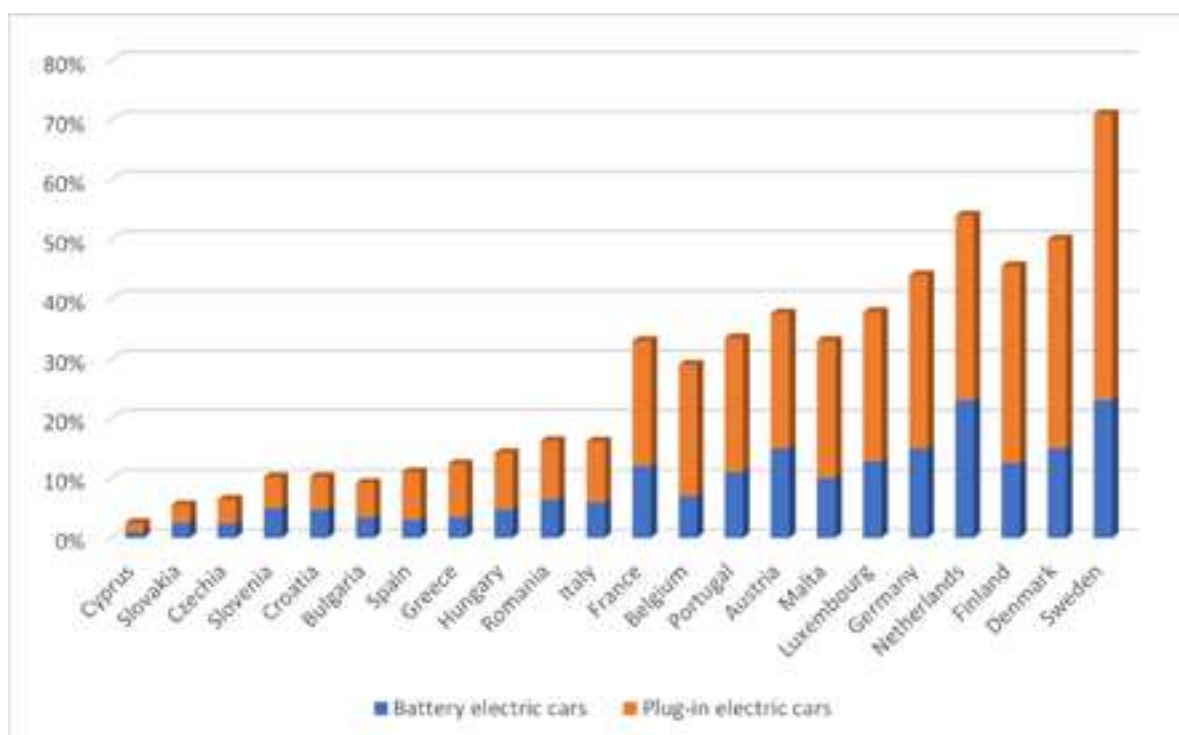
FIGURE 6. Registration of electric vehicles by city

In the diagram, you can see that the majority of registrations are in Denmark, Netherlands, and Sweden. Overall, the total percentage of registration of electric vehicles in these three countries is 44%, and Sweden 2021 registered a greater number of electric vehicles, and the total percentage of sales was 46%. The smallest number of registrations is in countries such as Cyprus, Slovakia, and the Czech Republic. In these three countries, the number of registrations of electric vehicles is only 1% of the total share.

Thanks to all of the above, we can conclude that the sales of electric vehicles are influenced by many factors such as electricity prices, taxes, the number of charging stations, etc.

Data

The European Union has set a goal of transitioning to electric vehicles and implementing a green energy approach. The aim is to phase out internal combustion engines, starting with passenger cars. This will have a significant impact on the development of new technologies and infrastructure that are environmentally friendly and promote progressive societal growth. To better understand the current state of electric vehicle sales in the EU, we analysed data from various sources such as Eurostat, EAFO (European Alternative Fuels Observatory), DG Energy, and World Bank. Our analysis focused on 27 EU countries including Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary Ireland Italy Latvia Lithuania Luxembourg Malta Netherlands Poland Portugal Romania Slovakia Slovenia Spain Sweden between 2018 and 2021. We used different variables to measure EV sales throughout this period. One essential variable was "EV Sales" obtained from EAFO - it helped us understand sales trends in the region by measuring the popularity and demand for electric vehicles.

Another critical variable we considered was the number of charging stations in each country (PCs) also taken from EAFO. The availability of charging infrastructure has been slow but is developing steadily with current trends. We also examined tax data from Eurostat to determine how taxes affect EV sales in the region. Additionally, "price of electricity" data was collected from Eurostat since there is an inverse correlation between electricity prices and EV sales.

Furthermore, the "Price of diesel" expressed in euros per 1000 litres was obtained from DG Energy as it helps explain why there is a positive correlation between diesel prices and electric vehicle sales across Europe.

Gross domestic product (GDP), geographic area size and employment data were also used as independent variables to analyse our findings further. These datasets were acquired from the World Bank website. We identified multiple factors that contribute to variations in EV adoption rates across different EU countries during our analysis using these various datasets.

Variable	Description	Sources
Sales	National sales of battery electric vehicles	EAFO
PC (Power Charging)	Number of publicly accessible power charging stations in a country	EAFO
Tax	National transport taxes as % of GDP (excluding fuel taxes)	Eurostat
Pelec (Price of Electricity)	Average national price of electrical energy for household consumers (all taxes and levies included)	Eurostat
Pdie (Price of Diesel)	Average prices of gasoline (1000L) including taxes in a country.	DG Energy
GDP (Gross Domestic Product)	Gross domestic product per capita based on purchasing power parity	World Bank
Area	Country's land area in sq. km.	EAFO
Emp (Employment)	The percentage of people in a nation who have jobs	World Bank

Variable	N	Mean	St. dev	MIN	MAX
Sales	108	38369.398148	90872.432515	143.0000	658972.000
Tax	108	11790.977315	17217.876601	0.0000	64714.0000
P elec	108	27.809607	287.118059	0.97900	2984.0000
PC	108	6805.814815	14324.121668	0.0000	82803.000
Area	108	156486.185185	170342.203604	316.0000	638475.000
P die	108	1232.728674	178.916355	516.6000	1677.044286
GDP	108	47311.985185	20290.520081	23011.500	134544.5000
Emp	108	0.550000	0.048414	0.420000	0.64000

Methodology

The analysis uses panel data regression methods to estimate the model which explains EV sales by several independent variables. To account for unobserved variables, country-fixed effects are included. These factors remain constant over time and include climate and road infrastructure. Additionally, time-fixed effects control for variables that remain unchanged across countries like new technologies or macroeconomic shocks. Taking the logarithm of all variables reduces bias since it simplifies coefficient interpretation and comparison while mitigating issues associated with heteroskedasticity and outliers. This approach also reduces the impact of extreme values. Robust estimators are further used to address heteroskedasticity concerns.

The main regression model is represented by the following equation:

$\log(Sales) = \beta_1 \text{ incentives} + \beta_2 \log(Tax) + \beta_3 \log(Pelec) + \beta_4 \log(PC) + \beta_5 \log(Pdie) + \beta_6 \log(Area) + \beta_7 \log(GDP) + \beta_8 \log(Emp)$

There are two ways to control for country-fixed effects: utilizing the first-difference method or incorporating fixed or random effects into the model. However, using the first-difference method can decrease statistical power by reducing sample size. As there were not many observations available, this study did not use this approach. Additionally, it is unsuitable for the dependent variable of battery electric vehicle sales due to its unique characteristics. Thus, fixed, and random effects were included in the model to account for country-fixed effects.

The Hausmann test is used for panel data analysis to assess the possibility of endogeneity (missing important unobserved variables in the regression).

The Null hypothesis set is that the random effects model is better than the fixed effects model. Based on the test, with the p-value being much less than 0.05, we can reject the Null hypothesis at a 5% significance level. If the Hausmann test suggests the presence of endogeneity the fixed effects model is believed to produce more reliable estimates. Finally, the inclusion of time random effects in the model was tested, and the null hypothesis that the coefficients for all years were equal to zero was strongly rejected. This implies that time random effects are necessary to control for time-specific shocks in the analysis.

Results

The primary regression results are presented in a table, where the initial column serves as a benchmark and is represented by pooled OLS. The R^2 value for the model is 0.762, with an adjusted R^2 of 0.746, indicating that 80% of the variance in national EV sales can be explained by independent variables. The tax and power charging coefficients for the main explanatory variables are both statistically significant at a rate of 1%, and positive. Moreover, an increase of 1% in national charging infrastructure results in an expected rise of 0.41% in BEV sales. Sales have a positive relationship with country size according to pooled OLS and are statistically significant as well, indicating that larger countries tend to have higher sales levels. As anticipated, the coefficients for GDP per capita and tax are also positive and statistically significant; however, it was surprising to find no positive correlation between diesel prices and BEV sales. Instead, the coefficient is indeed positive (and statistically

significant), suggesting that a rise of 1% in diesel prices would result in a corresponding increase (of about 1.6%) in BEV sales - this finding contrasts earlier research on HEVs that found a connection between HEV market share and gasoline prices (Diamond, 2009; Gallagher & Muehlegger, 2011). Sierzchula et al.'s (2014) more recent study discovered no noticeable link between EV market share and gasoline prices either.

The average consumer prices of gas oil automobiles in a country have significant impacts on the sales of BEVs. The correlation between these two variables indicates that government policies and taxation are crucial factors to consider when promoting sustainable transportation solutions. As taxes increase by 1%, sales of BEVs increase by 0.25%. This observation highlights the need for governments to implement favourable policies and incentives aimed at promoting eco-friendly vehicles such as battery electric vehicles. It is clear that consumers are becoming more environmentally conscious, hence their inclination towards green transport solutions like BEVs. The equation in the second regression (2) is estimated through a random effects model that considers country heterogeneity. The key variation in this model concerns diesel or gasoline. Despite the coefficient being negative, it is not statistically significant anymore. This could be due to the index showing no significant change over time, which the random effect takes into account. While there are minor differences in magnitude for other variables, the overall conclusions match those of pooled OLS (1).

In the third regression analysis, a fixed effects model is used instead of the random effects model. The variables for GDP and Diesel Price still show positive and significant coefficients at a one per cent level. However, it is noticeable that the impact of GDP has become more pronounced while the effect of improved charging infrastructure on vehicle sales has become less significant.

Time-invariant heterogeneity is eliminated from data by fixed effects models, which means that any variable that does not change over time in each country will be excluded from the model. Conversely, random effects models suppose that time-invariant heterogeneity does not correlate with the included regressors. Hence, a variable that remains constant over time for each country can still be incorporated into a random effects model.

Variables	Pooled OLS Log Sales	Random effects Log Sales	Fixed effects Log Sales
Intercept	-9.766 ***	-13.380 ***	
Log Tax	0.251 ***	0.198.	-2.379 *
Log Pelec	-0.008	-0.028	0.001
Log PC	0.407 ***	0.202 ***	0.116 *
Log Area	0.217 *	0.462 **	
Log Die	1.686 *	-0.392	-2.217 **
Log GDP	1.085 **	3.123 ***	10.409 ***
Log Emp	-0.613	-1.253	-1.064
N	108	108	108
R^2	0.762	0.502	0.590

Main regression

The estimated coefficient for GDP per capita is statistically significant at the 10% level and positive. This means that if all other variables remain constant, a 1% increase in GDP per capita is associated with a 1.085% increase in electric vehicle sales. This finding is consistent with our intuition that wealthier countries tend to have higher EV sales.

Tax increases on traditional gasoline or diesel vehicles could make BEVs more attractive to consumers, leading to an increase in BEV sales. This could be particularly true if the tax increase is significant and results in a noticeable increase in the cost of driving a traditional vehicle. Additionally, if the tax increase is accompanied by government incentives for BEV purchases, such as tax credits or rebates, this could further incentivize consumers to switch to BEVs.

It is plausible that an increase in taxes on all automobiles, including battery electric vehicles (BEVs), may have a negative impact on the sales of all vehicles. The relationship between tax increases and BEV sales could potentially be contentious. Additionally, this could have adverse ramifications for low-income buyers who are already struggling to afford vehicle purchases. In such cases where they cannot bear the increased expense of a BEV, this might further affect their sales. While it is true that BEVs are becoming more popular in recent years due to advancements in technology, government incentives, and growing environmental awareness among consumers - a potential tax hike can create roadblocks for those interested in purchasing these eco-friendly cars. Low-income buyers may be particularly affected by such levies as they will struggle with affordability issues. This consideration is even more relevant given the current economic situation brought about by the COVID-19 pandemic. Therefore, it is essential to examine how increasing automobile taxes will affect the overall market for both gasoline and electric-powered cars while considering its implications towards low-income groups' ability to transition towards sustainable modes of transportation effectively.

Conclusion

Analysing the influence of various factors on the growth of battery-electric vehicles in Europe was the objective of this research. A panel dataset comprising four years' worth of data from European nations was compiled for this purpose. In terms of charging infrastructure, which is an important factor in BEV adoption, the results are significant and positive. It means that an increase in charging infrastructure is associated with higher BEV adoption rates, holding other factors constant. This suggests that a lack of charging infrastructure may be a barrier to the adoption of BEVs and that policies aimed at improving charging infrastructure may help to increase the adoption of BEVs. Surprisingly, we found a positive and statistically significant relationship between area and EV sales. This may indicate that larger countries have more opportunities to implement BEVs, such as more affordable charging infrastructure or more diverse transportation options. The charging infrastructure is a crucial factor that significantly influences the adoption of battery electric vehicles (BEVs). As we have seen throughout the results, creating a comprehensive and accessible charging network is essential in eliminating range anxiety among consumers. The availability of reliable charging stations will provide drivers with peace of mind, knowing they can recharge their BEVs when needed. The future looks bright for BEV adoption as governments across the world continue investing heavily in electrification efforts. However, there is still work to be done concerning establishing adequate EV infrastructures such as increasing accessibility to power supply locations or building more fast-charging stations. In summary, creating an efficient and accessible charging infrastructure is critical towards boosting consumer confidence and driving up demand for electric vehicles.

National transport taxes as a percentage of GDP (excluding fuel taxes) have a significant impact on the sales of battery electric vehicles (BEVs). When these taxes increase by 1%, sales of BEVs increase by 0.25%. This correlation highlights the importance of tax policies in encouraging clean transportation options for consumers. Throughout history, governments around the world have implemented various types of transportation taxation to generate revenue and regulate vehicle usage. The focus has always been on fuel taxes as they are considered an important source of income for infrastructure development and maintenance. However, with more people shifting towards cleaner forms of travel such as electric cars, governments need to adapt their tax policies accordingly. It is important to note that national transport

taxes can also be used as a tool to encourage sustainable behaviour among consumers. Hence why policymakers must consider implementing lower or even zero tariffs on EVs while increasing taxation on petrol-based vehicles.

It is important to emphasize that generating electricity with low carbon emissions is vital, even though it was not the main topic of discussion in this article. For electric cars to become a reliable alternative, we must have a more environmentally friendly energy mix across Europe in the future.

References

1. Encyclopedia of Environment and Society—PDF Free Download. (n.d.). Retrieved April 9, 2023, from https://epdf.tips/encyclopedia-of-environment-and-society.html

2. Electric Vehicle Market 2022, Share, Size, Share, Revenue, Industry Analysis Forecast by 2030. (2023, March 14). http://web.archive.org/web/20230314183927/https://www.linkedin.com/pulse/electric-vehicle-market-2022-share-size-revenue-industry-riyaz-attar

3. Disadvantages & limitations of using Electric Vehicles—Elecles. (2023, January 29). https://elecles.com/disadvantages-limitations-of-using-electric-vehicles/

4. Research, B. I. S. (n.d.). Direct Air Capture: A Technology That Can Help Save the Planet. Retrieved April 9, 2023, from https://blog.marketresearch.com/direct-air-capture-a-technology-that-can-help-save-the-planet

5. Winton, N. (n.d.). High Price, Limited Performance Of European Electric Cars Might Boost China Minis. Forbes. Retrieved April 9, 2023, from https://www.forbes.com/sites/neilwinton/2020/12/06/high-price-limited-performance-of-european-electric-cars-might-boost-china-minis/

6. When teachers are asked to deploy other teachers, we learn a lot about teacher preferences—EdTech Hub. (n.d.). Retrieved April 9, 2023, from https://edtechhub.org/2022/05/13/when-teachers-are-asked-to-deploy-other-teachers-we-learn-a-lot-about-teacher-preferences/

7. Ammunition Market Size & Industry Outlook|2022 – 2031. (n.d.). Retrieved April 9, 2023, from https://www.researchdive.com/3619/ammunition-marketsales@tritonmarketresearch.com. (n.d.).

8. MIDDLE EAST AND AFRICA SUPER ABSORBENT POLYMER (SAP) MARKET 2019-2028. Retrieved April 9, 2023, from https://www.tritonmarketresearch.com/reports/middle-east-and-africa-super-absorbent-polymer-(sap)-market

9. Pasaoglu, G., Honselaar, M., & Thiel, C. (2012). Potential vehicle fleet CO2 reductions and cost implications for various vehicle technology deployment scenarios in Europe. Energy Policy, 40, 404–421. https://doi.org/10.1016/j.enpol.2011.10.025

10. Thiel, C., Schmidt, J., Van Zyl, A., & Schmid, E. (2014). Cost and well-to-wheel implications of the vehicle fleet CO2 emission regulation in the European Union. Transportation Research Part A: Policy and Practice, 63, 25–42. https://doi.org/10.1016/j.tra.2014.02.018

Factors Influencing the Economic Growth of Countries Depending on the Stage of Their Development.

Bolat Abdisattar, Abilmansur Amirbek, Talgat Kairullin

Abstract

This study examines the economic growth of countries from 2006 to 2018. It is a result of sustainable and intensive development of production, technology, and improvement of living conditions in the country. The main purpose of the study is to understand what the barriers to the transfer of countries to a higher level of development are, based on such factors as Infrastructure, Human Capital, Business Environment, Institutional System, Financial System and Macroeconomic indicators. The work is based on a sample of 109 countries studied across 431 indicators. The study uses approaches such as the "Min-Max" analysis, which aimed to find indicators that differed significantly between groups; the "Average" analysis, will provide a clear indication of the average across factors and countries from 2006 to 2018; and the "1.15" methodology outputs indicators that have improved by more than 15% in 2018 compared to 2006. Through these approaches, we expect to see a clear difference

in development between groups of countries. The result of this paper is that Business Environment, and Financial System and Macroeconomic indicators are important for the transition from low-income to lower-middle income group. Further, the country's transition from lower-middle income to upper-middle income is determined by the development of the Infrastructure, Human Capital, Business Environment, Institutional System, and Financial System indicators. And finally, the transition from the upper-middle income group to the high-income group involves the improvement of such indicators as Financial System, Infrastructure, and Human Capital. By developing these factors, the country will be able to overcome the barrier and move to a new stage of development.

Limitations

In this research we encountered the following limitations: the number of countries that we used in the analysis was 109 (much data on countries were not presented in indicators), and the number of indicators was 431, since data on indicators in open sources are not fully presented (data were not available for a specific period).

Introduction

Economic growth is one of the most important indicators of the country's development. It ensures continuous sustainable development, intensive development of production and technology, as well as improvement of living conditions. Thus, the study of factors affecting the economic growth of a country is an important task in creating conditions within the country, as well as improving its position on the world stage.

The paper aims to understand, depending on the stage of development of the country, what is a barrier to its transition to a higher level. Factors such as Infrastructure, Human Capital, Business Environment, Institutional System, Finan System and Macroeconomic indicators are recognized as important for economic growth and affect a country's transition from one group to another. However, the study shows that it is necessary to improve individual elements, which are determined by the country's sophistication and ability to accept progress. Our study tests 109 countries for possible economic growth between 2006 and 2018 and consists of 431 indicators of different systems.

In the process, we applied methods such as dividing countries into groups based on their Income and Complexity indicators. Analysis by "Min-Max," the purpose of which was to find indicators that differed greatly between groups. The "Average" analysis allowed us to visually see the average across factors and countries from 2006 to 2018. The "1.15" methodology outputs indicators that have improved by more than 15% in 2018 compared to 2006. It is expected that we will be able to identify factors that contribute to the economic growth of countries and their transition to more developed groups.

This article has the following structure: first, we looked at various analyses, studies and theories related to the economic growth of countries. Then we collected all the information and indicators necessary for our research. The third is a methodology - this is the main part of the article, which describes the analysis in accordance with our goal. The last one is a discussion of the results.

Literature review

Solow (1956) argued that technological progress is a key factor in development, thanks to which some countries are developing much faster than others. The model showed that technological progress leads to increased productivity, which causes an increase in production and income. In addition, Solow's work highlighted the importance of investment in research and development (R&D) as a means of stimulating technological progress, helping to increase productivity and stimulate economic growth. Overall, Solow's work was essential in establishing the importance of technology and innovation, and his model is widely used by economists to examine the relationship between the two.

Advanced technology is a factor that has an impact on economic development. The article "An empirical study of the impact of technological innovation on economic growth - take Shandong Province as an example" says that the development of high-tech industries, as well as innovative technologies have become an important strategic object for the economic growth of countries and entire regions. Jin-Xiu (2019) found that the level of technological innovation, using Shandong province as an example from 2001 to 2016, has a positive impact on economic growth. However, this effect is less than the impact of capital and labour. Thus, technological innovations can

increase labour productivity and the use of production factors, open new products, and consumer markets, promote the emergence of new products, and optimize and modernize industrial structures, thereby affecting the development of the economy (Jin-Xiu, 2019).

Hausmann et al. (2014) emphasize that institutions, human capital (quality of education), the financial system and competitiveness have different aspects of the same complexity of the economy. They also have different approaches to the impact of economic growth and development. Variables of economic complexity contain more information about the potential and income of growing countries than other widely used indicators. The above-mentioned indicators such as human capital, governance institutions, and competitiveness best enable the future growth of countries more than other indicators.

Infrastructure is the next indicator that play's important role in influencing economic growth. According to Rao and Srinivasu (2013), it includes factors such as transport infrastructure, electricity and water supply, healthcare, and education. Investment in infrastructure contributes significantly to economic growth by increasing productivity and quality of life and contributes to economic growth and reducing economic inequality, poverty, and deprivation in the country (Rao & Srinivasu, 2013).

The next factor influencing a country's economic growth is the financial system. Financial institutions such as banks, insurance companies, and investment firms, help mobilize savings and channel these funds into productive investment. This creates a cycle of investment, as well as creating jobs and increasing consumer spending. However, a dysfunctional financial system can have a negative impact on economic growth. Inadequate regulation, weak governance, and financial instability can all have an impact. Which can ultimately lead to a decline in investment and consumer spending. Levine (1997) states that there is a relationship between financial development and economic growth. The author emphasizes that financial instruments reduce information and transaction costs that affect the level of savings, investment decisions, technological innovations, and long-term growth rates (Levine, 1997).

Institutions play an important role in the economic growth of countries because they provide the basis for economic activity. The importance of an effective and at the same time transparent management policy that influences the allocation of resources in the country (Acemoglu et al., 2005), setting the pace of investment and the movement of economic growth (Easterly & Levine, 2003). The theory is supported by Scully (1988) "Under the influence of the rule of law, private property, and again the uniform distribution of resources, growth in the country comes much faster".

In addition to these indicators affecting economic growth is human capital. Human capital implies that investments in industries such as education, and medicine increase the level of qualification and productivity of workers (Preston et al., 2004). The impact on the economy is due to the improvement of workers' health and spiritual enlightenment (We, 2011).

The article "The Impact of Entrepreneurship on National Economic Growth: Analysis using the GEM Database" examines the relationship between total entrepreneurial activity (TEA) and GDP growth in 36 countries, thereby determining the relationship between them (van Stel et al., 2004). The result was positive, but this relationship depends on the economic development of the country. Van Stel et al. (2004) argue that entrepreneurship affects countries in different ways, depending on their level of development. According to Boudreaux (2019), entrepreneurship has an impact on economic growth, but not in all countries. The author's research shows that entrepreneurship has a positive impact on economic growth in developed countries, but negatively affects growth in developing countries. This influence in developing countries is confirmed by Boudreaux (2019) that in this group, necessity-motivated entrepreneurship (NME) is more widespread than opportunity-motivated entrepreneurship (OME). Revealing the term in simple words, NME is a desire to find a job, and OME is to create your own business. Thus, countries need to pay more attention to OME, at the same time it is necessary to reduce the strong influence of NME this will create the most suitable and favourable environment for business.

Other papers distinguish the importance of different factors for economic growth depending on their income level. The study written by Nye et al. (2002) confirms that the expansion of trade leads to a proportional increase in the country's income. And the research by Rioja and Valev

(2014) shows that «in low-income countries, banks, unlike stock markets, had a positive impact on capital accumulation». The main factors characterizing the weak development of low-income countries, in the example of the country of Uganda, are "corruption, limited sources of financing, substandard utilities and high taxes" that hinder the economic growth of this group of countries (Ishengoma & Kappel, 2011). According to Werker (2013), the factors that are barriers to the development of Liberia (low-income country) are Infrastructure (roads, electricity, communications), Financial System (high dependence on external capital, as well as a low level of national savings and attracted investments). Problems also exist in the Institutional system (characterized by weak management measures, except for transparency), and the last factor that requires attention is Human capital (high infant mortality, high birth rate, poor quality of school education). The next one is Timor - Leste that refers to also low income. According to Sacchetto et al. (2021), the factors that are barriers to the development of Timor - Leste (low-income country) are the Financial System (Access to credit, rational management of public finances, the presence of DFI in Timor-Leste is minimal due to the low number of domestic producers and the inability to attract investment). Infrastructure also requires solutions to problems (Road construction, Improvement of standards of international airports and air traffic, development of seaports, electricity supply, Internet).

Over time an increase in the country's gross domestic product leads to economic growth. With this transfer of countries from the group of middle-income countries to the group of higher-income countries, the influencing factors are interrelated. The results of Zaidi et al. (2019) show that resources have an impact on the financial system and human capital. Thus, there is a need for the development of human capital and financial institutions for the development of high-income countries.

ICT is one of the driving factors of economic development, developing technologies and infrastructure in countries. Using the example of the country Ukraine (lower–middle income), the author Bilan (2019) argues that the concentration of technology in the country has a positive effect on the economic growth of Ukraine, attracting investment in infrastructure development.

According to the authors Hausmann and Klinger (2008), we have identified factors in Pakistan that hinder economic development. Such factors include problems in the field of Institutional Systems (weak management policy, insufficient stimulation of private sectors by the state, as well as transparency of state structures). There are also problems in Human Capital (the need for qualified labour, poor quality of education), and the latter is Infrastructure (water supply, energy conservation, as well as transport infrastructure, this includes the quality of road surfaces and railway tracks). According to the author Hausmann (2019), there are factors in Jordan (a lower middle-income country) that hinder its economic growth. Such factors include the areas of the Financial System (financial constraints and balance of payments), regarding Infrastructure (problems with water supply, as well as problems with high electricity tariffs). According to the authors Hausmann et al. (2005) the main factors affecting El Salvador's economic growth are the Financial System (high cost of finance), as well as Human Capital (low level of education in the country, affecting the qualifications of the workforce), Institutional System (Property rights, corruption), Taxes which is including in Business environment, also bad Infrastructure.

The economic growth in middle-income countries has been highly uneven. While some countries have experienced rapid and sustained economic growth, others have struggled to make even modest levels of progress. According to Varsakelis (2006), countries can achieve their economic development through investments in Infrastructure, Human Capital, and Financial Systems as well as through policies that encourage Business Environment. Another important factor influencing development is the Institutional System. Countries with efficient and transparent institutions are more prone to economic growth and development (Varsakelis, 2006).

There are several works on upper-middle-income countries, such as Kazakhstan, China, Albania, Namibia, and Sri Lanka. According to the authors Barrios et al. (2023) the main problems Kazakhstan faces in the development process were identified, such as the Financial System (mainly relatively high lending rates, collateral requirements, and settlement mechanisms), then Human capital (quality of education, experience of work, lack of qualified workers). There are also problems in such areas as

Infrastructure (including water supply systems, power grids, the quality of road surfaces, as well as the length of railway tracks), as well as Institutional Systems (this includes corruption, policy uncertainty, management efficiency and "elite capture"). And the last factor creating barriers to economic prosperity is the Business Environment (limited strategic value) factor.

According to the authors, Hausmann et al. (2006) the main problems in China affecting economic growth are the Institutional System (property rights, as well as bankruptcy legislation), Business Environment (tax policy) and Human Capital is also important (lack of knowledge and competencies in the field of technical education and poor development of medicine). According to the authors O'Brien et al. (2017) the main problems of Albania that constraints the economic growth of the country are Institutional Systems (corruption, bureaucracy, political and judicial system), the Business Environment indicator (taxation, as well as access to land and registration of property). The country's Financial System is also an obstacle (this includes weak financial intermediation, inefficient use of funds and resources, as well as a low level of lending), also important according to O'Brien et al. (2017) is Infrastructure (poor-quality and limited road networks, poor development of international communications, poor condition of railway tracks). The author also identified the Human Capital indicator as problematic, which does not have such a strong impact on the country's economic growth but solving these factors (poor quality of education and lack of skills) would improve the country's standard of living.

According to the authors Hausmann et al. (2022), the main problems in the country affecting economic growth of Namibia are Human Capital (high unemployment, low qualifications of the workforce, poor quality of secondary and higher education), Business Environment (lack of sufficient development of ports for trade), as well as the Financial System (attraction of foreign capital). According to the authors Hausmann et al. (2012), identified the main issues hindering the economic development of Tunisia. The problem areas include the Institutional System (the country's legislation and the lack of a legal framework that restricts the rights and activities of private enterprises), also Human Capital (poor quality of education and knowledge), and the last Financial System (problems with lending, as well

as the lack of financial support from the state to small and medium-sized businesses). According to a study by Sri Lanka Growth Diagnostic (2018), the main problems in the country affecting economic growth are Infrastructure (water supply, electricity, transport infrastructure). In the Business Environment indicator (tax policy, unstable and unpredictable tax administration policy). Institutions are also an obstacle (access to land, labour legislation, political uncertainty, violations of the rule of law). The study also highlights problematic indicators that do not have a strong impact on the economic growth of the country's countries. Such factors include the Financial System (interest rate reduction, non-performing loans), as well as Human Capital (quality of education and healthcare).

The studies above show us that countries with the same level of income might have different factors that hinder their development, which is intuitively correct as the level of development is not only defined by income per capita but also by the level of economic advancement of the country. For example, Kazakhstan, which mainly exports raw materials, and China, which produces high-tech goods, are both in the upper - middle income group. The theoretical work of Porter (1998) presents an alternative view on the level of development, it divides countries into factor, investment, innovation, and wealth-driven economies.

Factor–driven - this economy includes factors such as natural resources, profitable logistics, as well as cheap labour. Groups of these countries are exposed and vulnerable to macroeconomic changes and have low levels of productivity and innovation. To move more into a developed group, according to Porter (1998) factors of production such as infrastructure development, investment in education, to enter new markets and technologies, improving innovation through business development to the development of new services and products should be based. To access new markets and technologies, it is necessary to open trade and investment.

Investment–driven is a contribution to new equipment and technologies that allow firms to produce goods that are in demand. Thanks to this, countries can improve their competitiveness and influence on the world market. Factors such as a stable domestic market, a supportive government (providing subsidies and services to private sectors), as well as a skilled workforce.

According to Porter (1998), these factors contribute to the transition from factor–driven to investment – driven. After the transition of countries to investment–driven, they can compete in more complex industries, therefore this will help to increase wages and living standards of the population. However, when switching to investment–driven, a country may face such problems as constant investment, and competitiveness with other developed countries (Porter, 1998). Thus, by overcoming these difficulties thanks to this stage, the country can significantly increase its economic development.

Innovation–driven is an innovation-based economy in which countries can compete by producing new products or services. It is characterized by countries with high development, highly skilled workforce, and high support from the government. According to Porter (1998), factors such as an emphasis on research and development, a highly skilled workforce, and a supportive government contribute to the transition of countries from the investment–driven to innovation–driven group. Countries in innovation–driven due to the presence of sophisticated technologies have higher wages for workers, and the standard of living of the population is much higher. However, in the process of being in this group, countries may face such problems as the constant introduction of innovations and technologies, and competition with other countries (Porter, 1998).

Wealth – driven is the last stage of economic development in which the country has achieved perfection and wealth. At this stage, according to the authors, countries are characterized by such negative factors as attracting less investment, stagnation of industrial development, and an increase in unemployment, according to Porter

(1998). To avoid these consequences, countries need to return to the period of innovation, to promote and develop the country's economy. The level of development of countries is determined not only by the level of income but also by the complexity of the economy. As mentioned earlier, Kazakhstan is still dependent on factors of production but has incomes comparable to China, which has already moved from investment policy to innovation, although these countries are in the same income level group.

To sum up, we can say that depending on the level of development of the country, the importance of factors such as infrastructure, human capital, the financial system and macroeconomic indicators, institutions and the business environment affect economic growth in different ways. Also, in addition, to consider Porter's analysis, we need to consider how technologically advanced a product the country produces. Therefore, we have divided the countries into groups according not only to their income level, but also to the level of complexity.

Data

Our analysis includes data from 2006 to 2018 in which 8 indexes were taken using public sources. The total number of indicators was 431. The indicators of each index are presented in the range from 0 to 1, where the value of 1 is the maximum. The number of indicators is not presented fully, as we did not have many values, and we also excluded gender indicators. Period shows the period for which information on this index is presented. All information is described in more detail in the table 1:

Table 1

Index	Point system	Number of indicators	Distribution of indicators	Number of countries	Period
Global Competitiveness Index	From 0–1	120/157	IFS- 13 HC- 19 BE- 43 IS- 28 FS- 17	109/141	2006-2020
Bertelsmann Transformation Index	From 0–1	71/121	IFS- 0 HC- 0 BE- 7 IS- 57 FS- 7	109/137	2006-2020
IMD	From 0–1	17/100	IFS- 1 HC- 2 BE- 6 IS- 4 FS- 4	109/193	2006-2020
World Governance Indicators	From 0–1	6/36	IFS- 0 HC- 0 BE- 0 IS- 6 FS- 0	109/197	2006-2020
Rule of Law Index	From 0–1	44/52	IFS- 0 HC- 0 BE- 0 IS- 44 FS- 0	109/140	2012-2020
Index of Economic Freedom	From 0–1	12/12	IFS-0 HC-0 BE-3 IS- 6 FS- 3	109/184	2006-2020
World Bank Ease of Doing Business Report	From 0–1	152/205	IFS-0 HC-0 BE- 152 IS-0 FS-0	109/197	2006-2020
Human Capital Index	From 0–1	9/27	IFS- 0 HC- 9 BE- 0 IS- 0 FS- 0	109/172	2012, 2016-2020
Total		431	431		

Description of the indexes

Global Competitiveness Index (GCI) conducted by the World Economic Forum. It consists of factors such as infrastructure, health and education, market efficiency, technological innovation, the business environment, and the macroeconomic environment. The purpose of this analysis is to provide insight into the drivers

of a country's productivity and economic growth. The Bertelsmann Transformation Index (BTI), the reason for this examination is to survey political and social integration, and financial change, and run the show of law. The IMD World Competitiveness Ranking positions nations based on financial and social pointers. The reason for this examination is to think about competitiveness utilizing variables: financial markers, open organization effectiveness, trade productivity, and foundation. World Governance Indicators (WGI) incorporate such markers as voice and responsibility, steadiness in legislative issues, the requirement for government, the rightness of the law, the nonappearance of debasement, and the nonappearance of guiltiness. The objective is to determine the quality of the open organization. The Rule of Law Index checks the matchless quality of law in all nations. It incorporates components such as the nonappearance of bribery, the productivity of the legal framework, the straightforwardness of the government, enactment, respect, and criminal equity. The Economic Freedom Index has been checked to determine the financial opportunity of nations. It looks at viewpoints such as the immaculateness of the law, the application of the law, revealed markets, and property rights. The World Bank's "Ease of Doing Business" report measures how easy it is to do business. It is also useful for potential investors due to factors such as starting a business, obtaining a construction authorization, connecting electricity, registering property, access to financing, protecting investors' rights, taxation, cross-border trade, and solving insolvency problems. The Human Capital Index measures and assesses how well people use their opportunities in the labour market. It assesses factors such as education, health care, and the quality of employment opportunities.

Missing countries

This table shows the countries that we did not include in the analysis and the reasons:

Table 2

Country	Why we have not included it
Andorra; Antigua and Barbuda; Austria; Barbados; Belgium; Belize; Brunei; Canada; Cape Verde; Comoros; Cyprus; Denmark; Dominica; Federated States of Micronesia; Fiji; Finland; France; Germany; Greece; Grenada; Guyana; Iceland; Ireland; Israel; Italy; Japan; Liechtenstein; Luxemburg; Macedonia; Maldives; Malta; Marshall Islands; Nauru; Netherlands; New Zealand; Norway; Palau; Portugal ;Saint Kitts and Nevis; Saint Lucia; Samoa; San Marino; Sao Tome and Principle; Seychelles; Solomon Islands; South Ossetia; Spain; State of Palestine; Suriname; Sweden; Switzerland; Tonga; Tuvalu; United Kingdom; United States America; Vanuatu; Vatican	The absence of these countries in our list is because we took the countries on the list of The Bertelsmann Transformation Index as a basis. Since most of the constituent indexers just belong to this index. In this regard, we decided to reduce the number of countries from 193 to 137.
Afghanistan, Benin, Bhutan, Burundi, Central African Republic, Chad, Djibouti, Equatorial Guinea, Eritrea, Gambia, Guinea-Bissau, Haiti, Iraq, Kosovo, Lesotho, Montenegro, Nepal, Niger, North Korea, Rwanda, Sierra Leone, Somalia, South Sudan, Sudan, Syria, Taiwan, Timor-Leste, Venezuela	The absence of these countries in our analysis is explained primarily by the fact that these countries do not have ECI or GDP indicators. Eventually, we were unable to identify the economic groups into which these countries could be classified.

Therefore, in the end, we received data for this period.

Table 3

Year	Countries	Indicators
2006	107	431
2008	109	431
2010	109	431
2012	109	431
2014	109	431
2016	109	431
2018	109	431

Methodology

As mentioned in the literature review different countries have different factors of economic growth, so first, we divide countries. We use the following methods: Country division by Economic Complexity Index. We took all the ECI data from 2006-2019 and divided it in quartiles (using number of observations). ECI is an indicator of the potential of the economy that is present in the country. By focusing on those activities that are relatively more complex or offer more opportunities for the country, success can be achieved. The analysis also provides information about what technological capabilities different countries have and how they can take advantage of them (Hausmann et al., 2014).

Table 4

ECI	Above	Below
Low complexity (Q1)	-3.00	-1,37
Middle-lower complexity (Q2)	-1,37	0,04
Middle-upper complexity (Q3)	0,04	1,45
High complexity (Q4)	1,45	3.00

Country division by Income. First, we took the GNI per capita (constant 2015 US$) data from the World Bank website. Further, based on the 2016 data, since we do not have data for 2015, and the most approximate is 2016, we have created data on these indicators. The data range is shown in the table below. Thus, having formed groups of countries according to GNI indicators, we were able to create a range of GDP, which will be for all years and countries, based on constant 2015 US$.

Table 5

GNI	Above	Below
Low income	0	1025
Lower-middle income	1026	4035
Upper-middle income	4036	12475
High income	12476	

Below is a table with criteria for classifying groups by GDP indicators.

Table 6

GDP	Above	Below
Lower	0	1033
Lower-middle income	1034	4088
Upper-middle income	4089	12797
High income	12798	

On this basis, we obtained groups, which are distributed according to the range of GDP and complexity. Initially, we had to have 12 groups, there were such groups: 1,1 – Poor countries with low complexity; 1,2 – Poor countries with lower-middle complexity; 2,1 – Lower-middle income countries with low complexity; 2,2 – Lower-middle income countries with lower-middle complexity; 2,3 – Lower-middle income countries with upper-middle complexity; 3,1 – Upper-middle income countries with low complexity; 3,2 – Upper-middle income countries with lower-middle complexity; 3,3 – Upper-middle income countries with upper-middle complexity; 4,1 –High-incomee countries with low complexity; 4,2 – High income countries with lower-middle complexity; 4,3 - High income countries with upper-middle complexity; 4,4 - High income countries with high complexity. However, since there were few countries in the groups, we combined some groups. As a result, we have the following table:

Table 7

Income, complexity	Countries (2018)
Group 1 (Poor countries)	Burkina Faso, Congo, DR, Ethiopia, Guinea, Liberia, Madagascar, Malawi, Mali, Mozambique, Tanzania, Togo, Uganda
Group 2,1 (Lower – middle income country with low complexity of production)	Angola, Congo, Rep., Nigeria, Papua New Guinea
Group 2,2 (Lower – middle income country with a lower – middle complexity of production)	Bangladesh, Bolivia, Cambodia, Cameroon, Côte d'Ivoire, Egypt, Eswatini, Ghana, Honduras, Indonesia, Kenya, Kyrgyzstan, Laos, Mauritania, Moldova, Morocco, Myanmar, Nicaragua, Pakistan, Senegal, Tajikistan, Uzbekistan, Yemen, Zambia, Zimbabwe
Group 2,3 (Lower – middle income country with upper – middle complexity of production)	El Salvador, India, Jordan, Philippines, Ukraine, Vietnam
Group 3,1;3,2 (Upper – middle income country with low to lower – middle complexity of production)	Albania, Algeria, Armenia, Azerbaijan, Botswana, Cuba, Dominican Republic, Ecuador, Gabon, Georgia, Guatemala, Iran, Jamaica, Kazakhstan, Libya, Mauritius, Mongolia, Namibia, Paraguay, Peru, Russia, South Africa, Sri Lanka, Turkmenistan
Group 3,3;3,4 (Upper - middle income country with upper – middle to the high complexity of production)	Belarus, Bosnia and Herzegovina, Brazil, Bulgaria, China, Colombia, Costa Rica, Lebanon, Malaysia, Mexico, North Macedonia, Romania, Serbia, Thailand, Tunisia, Turkey

Group 4,1;4,2 (High income country with low to lower – middle complexity of production)	Argentina, Chile, Kuwait, Oman, Panama, Qatar, Trinidad and Tobago, United Arab Emirates, Uruguay
Group 4,3 (High income country with upper – middle complexity of production)	Bahrain, Croatia, Estonia, Latvia, Lithuania, Poland, Saudi Arabia, Slovakia
Group 4,4 (High income country with a high complexity of production)	Czech Republic, Hungary, Singapore, Slovenia, South Korea

Normalization. Further, we normalized the available values thanks to the normalization formula to obtain values in the range from 0 to 1, to standardize all digits.

Formula: *Normalization = (Index – Min) / (Max – Min)*

To perform this action, we put our indicators in order, ordering them one after another in a certain sequence, and so we did this every year. Then, taking the indices for each year separately, we found the minimum and maximum values for each indicator and applied them to our formula. Thus, we got all the values in the range from 0 to 1.

Min - Max Approach. To identify which indicators influenced the growth of this group, we used the min max approach. It implies subtracting the minimum indicator of one group from the maximum indicator of another group. To do this, we take the indicators for each group and compare the two groups with each other. We find the MIN indicator of a developed country and subtract it from the MAX indicator of a less developed country. Thus, as a result, indicators are identified that allow us to identify due to which indicator this group is more developed.

1.15 Analysis. These countries have experienced growth over the period from 2006 to 2018, so we have identified indicators that have grown by at least 15% over this period. To reveal this, we took the index for 2006 and 2018 and then divided the value of 2018 by 2006. If the resulting number is greater than 1.15, it means that this indicator has grown.

Below is a table with the average values of the groups for each indicator. To do this, we combined and put together indicators in each direction, such as Infrastructure, Human Capital, Business Environment, Institutional System, and Financial System and Macroeconomic indicators and found the average value of each indicator for a single year.

Table 8

Groups	Indicators	2006	2008	2010	2012	2014	2016	2018
1	IFS	0,2679	0,1476	0,1592	0,1699	0,1421	0,1646	0,1564
	HC	0,4505	0,3454	0,3814	0,3636	0,3456	0,3276	0,3327
	BE	0,4307	0,4032	0,4141	0,4243	0,4155	0,4629	0,4660
	IS	0,4501	0,4218	0,4270	0,4279	0,4191	0,4390	0,4327
	FS	0,4100	0,3327	0,3809	0,3852	0,3697	0,4487	0,4093
2,1	IFS	0,2279	0,1247	0,1467	0,1911	0,1460	0,1388	0,1205
	HC	0,3575	0,3216	0,4405	0,3326	0,3339	0,2705	0,3264
	BE	0,4391	0,4469	0,4484	0,4173	0,4382	0,4762	0,4763
	IS	0,4435	0,4122	0,4295	0,3931	0,4276	0,4349	0,3880
	FS	0,3618	0,3570	0,4091	0,3846	0,3780	0,4044	0,3950
2,2	IFS	0,2505	0,2283	0,2623	0,2417	0,2472	0,2556	0,2521
	HC	0,4345	0,4056	0,4512	0,3979	0,4150	0,4063	0,4321
	BE	0,4559	0,4544	0,4749	0,4566	0,4716	0,4989	0,5009
	IS	0,4641	0,4460	0,4433	0,4197	0,4309	0,4254	0,4179
	FS	0,4391	0,4086	0,4408	0,4039	0,4027	0,4560	0,4193
2,3	IFS	0,2657	0,2894	0,3088	0,2908	0,3144	0,3094	0,3298
	HC	0,4246	0,4973	0,5016	0,4487	0,4530	0,4793	0,5072
	BE	0,4443	0,5114	0,5130	0,5080	0,5235	0,5349	0,5503
	IS	0,4401	0,5158	0,5066	0,4845	0,5049	0,5077	0,5046
	FS	0,4339	0,4721	0,4839	0,4732	0,4586	0,5048	0,5079
3,1;3,2	IFS	0,3646	0,3308	0,3486	0,3170	0,3222	0,3544	0,3637
	HC	0,4861	0,4595	0,5188	0,4327	0,4299	0,4947	0,5164
	BE	0,5067	0,5051	0,5187	0,4903	0,4896	0,5289	0,5363
	IS	0,5673	0,5421	0,5246	0,5043	0,4840	0,5031	0,4928
	FS	0,4960	0,4688	0,4856	0,4693	0,4430	0,4970	0,4679
3,3;3,4	IFS	0,3371	0,4129	0,3951	0,3776	0,3812	0,4017	0,3870
	HC	0,5107	0,5551	0,6033	0,5139	0,5047	0,5620	0,5776
	BE	0,5251	0,5403	0,5623	0,5453	0,5572	0,5919	0,5982
	IS	0,5983	0,5932	0,5847	0,5695	0,5625	0,5292	0,5238
	FS	0,5082	0,5434	0,5306	0,5154	0,5167	0,5332	0,5337
4,1;4,2	IFS	0,3935	0,4552	0,5160	0,4404	0,4891	0,5013	0,4985
	HC	0,5363	0,5254	0,5539	0,5164	0,5654	0,5912	0,5965
	BE	0,4940	0,5342	0,5500	0,5326	0,5741	0,5842	0,5865
	IS	0,5078	0,5244	0,5327	0,5652	0,5668	0,5845	0,6039
	FS	0,4548	0,5400	0,5609	0,5271	0,5374	0,5514	0,5736
4,3	IFS	0,5541	0,4671	0,4497	0,5189	0,5038	0,5186	0,5147
	HC	0,6508	0,6125	0,5833	0,6034	0,5743	0,6256	0,6412
	BE	0,6649	0,5513	0,5738	0,6275	0,5936	0,6450	0,6388
	IS	0,7931	0,6798	0,6384	0,7019	0,6867	0,6885	0,6531
	FS	0,6514	0,5613	0,5475	0,5960	0,5664	0,6062	0,5847

4,4	IFS	0,3938	0,6052	0,6587	0,6463	0,5805	0,5705	0,5931
	HC	0,6915	0,7377	0,7709	0,6697	0,6390	0,6680	0,7200
	BE	0,6612	0,6689	0,6992	0,6721	0,6507	0,6811	0,6958
	IS	0,7389	0,7592	0,7550	0,7348	0,7179	0,7081	0,7082
	FS	0,6168	0,6695	0,6354	0,6043	0,6011	0,6388	0,6534

We have done work with countries that have experienced growth. We identified the average values for each indicator for 2006 and 2018, to see the difference between the indicators. 25 countries have moved to a higher group:

Table 9

Country	Transfer	Indicators	2006	2018
Bangladesh	1,2-2,2	Infrastructure	0,1064	0,2088
		Human Capital	0,3472	0,4168
		Business Environment	0,4272	0,4618
		Institutional System	0,442	0,3911
		Financial system and Macroeconomic indicators	0,4143	0,4396
Myanmar	1,2-2,2	Infrastructure	0,1163	0,0901
		Human Capital	0,3512	0,4568
		Business Environment	0,2663	0,4489
		Institutional System	0,3325	0,3361
		Financial system and Macroeconomic indicators	0,2641	0,2627
Zambia	1,2-2,2	Infrastructure	0,1565	0,181
		Human Capital	0,3555	0,3818
		Business Environment	0,5204	0,518
		Institutional System	0,5537	0,4605
		Financial system and Macroeconomic indicators	0,4609	0,4373
Kyrgyzstan	1,2-2,2	Infrastructure	0,4746	0,2405
		Human Capital	0,5478	0,503
		Business Environment	0,498	0,5142
		Institutional System	0,4613	0,4564
		Financial system and Macroeconomic indicators	0,554	0,4598
Mauritania	2,1-2,2	Infrastructure	0,1861	0,132
		Human Capital	0,3044	0,2643
		Business Environment	0,3815	0,4311
		Institutional System	0,4732	0,3629
		Financial system and Macroeconomic indicators	0,3093	0,2958

Country	Range	Indicator	Value 1	Value 2
Azerbaijan	2,2-3,1	Infrastructure	0,2972	0,5039
		Human Capital	0,4501	0,5869
		Business Environment	0,4441	0,5944
		Institutional System	0,3804	0,4524
		Financial system and Macroeconomic indicators	0,4365	0,4877
Vietnam	2,2-2,3	Infrastructure	0,2308	0,3291
		Human Capital	0,402	0,5376
		Business Environment	0,446	0,5543
		Institutional System	0,379	0,4294
		Financial system and Macroeconomic indicators	0,4503	0,4949
Albania	2,2-3,2	Infrastructure	0,1454	0,3709
		Human Capital	0,4342	0,6269
		Business Environment	0,4515	0,5683
		Institutional System	0,4929	0,5514
		Financial system and Macroeconomic indicators	0,4517	0,5245
Algeria	2,2-3,2	Infrastructure	0,2454	0,3117
		Human Capital	0,4202	0,4863
		Business Environment	0,3664	0,4403
		Institutional System	0,4093	0,4334
		Financial system and Macroeconomic indicators	0,3648	0,3994
Armenia	2,2-3,2	Infrastructure	0,2182	0,3647
		Human Capital	0,4171	0,5542
		Business Environment	0,4274	0,5913
		Institutional System	0,4701	0,4919
		Financial system and Macroeconomic indicators	0,4237	0,4811
Georgia	2,2-3,2	Infrastructure	0,2743	0,41
		Human Capital	0,5062	0,5177
		Business Environment	0,4984	0,6173
		Institutional System	0,5533	0,6104
		Financial system and Macroeconomic indicators	0,5124	0,5059
Guatemala	2,2-3,2	Infrastructure	0,3344	0,2757
		Human Capital	0,4106	0,4072
		Business Environment	0,4803	0,5362
		Institutional System	0,4847	0,4178
		Financial system and Macroeconomic indicators	0,4422	0,5356

Sri Lanka	2,2-3,2	Infrastructure	0,2946	0,3216
		Human Capital	0,5518	0,5646
		Business Environment	0,5095	0,5466
		Institutional System	0,5664	0,5339
		Financial system and Macroeconomic indicators	0,5144	0,4981
Bosnia and Herzegovina	2,3-3,3	Infrastructure	0,1949	0,298
		Human Capital	0,4735	0,5566
		Business Environment	0,4373	0,5255
		Institutional System	0,4643	0,4771
		Financial system and Macroeconomic indicators	0,5031	0,4795
Chile	3,2-4,2	Infrastructure	0,4796	0,4606
		Human Capital	0,517	0,6243
		Business Environment	0,6352	0,6134
		Institutional System	0,7869	0,7505
		Financial system and Macroeconomic indicators	0,652	0,6575
Uruguay	3,3-4,2	Infrastructure	0,6545	0,4744
		Human Capital	0,5144	0,5791
		Business Environment	0,5486	0,5468
		Institutional System	0,8049	0,7886
		Financial system and Macroeconomic indicators	0,6312	0,5596
Panama	3,3-4,2	Infrastructure	0,2239	0,4894
		Human Capital	0,3457	0,4657
		Business Environment	0,5055	0,5864
		Institutional System	0,5537	0,5619
		Financial system and Macroeconomic indicators	0,5596	0,6287
Kuwait	4,1-4,2	Infrastructure	0,4234	0,3942
		Human Capital	0,5385	0,5123
		Business Environment	0,5129	0,527
		Institutional System	0,6064	0,4705
		Financial system and Macroeconomic indicators	0,4071	0,5756
Croatia	3,3-4,3	Infrastructure	0,4285	0,4885
		Human Capital	0,5887	0,6327
		Business Environment	0,5034	0,5845
		Institutional System	0,6553	0,6132
		Financial system and Macroeconomic indicators	0,5191	0,5096

Lithuania	3,3-4,3	Infrastructure	0,1621	0,5184
		Human Capital	0,3701	0,66
		Business Environment	0,5048	0,6782
		Institutional System	0,7114	0,7587
		Financial system and Macroeconomic indicators	0,4941	0,6082
Poland	3,3-4,3	Infrastructure	0,2146	0,4529
		Human Capital	0,4872	0,6462
		Business Environment	0,5286	0,6483
		Institutional System	0,6366	0,6737
		Financial system and Macroeconomic indicators	0,549	0,6124
Slovakia	3,3-4,3	Infrastructure	0,7403	0,4439
		Human Capital	0,7535	0,5879
		Business Environment	0,702	0,644
		Institutional System	0,8579	0,6522
		Financial system and Macroeconomic indicators	0,7001	0,6428
Saudi Arabia	4,2-4,3	Infrastructure	0,3549	0,5017
		Human Capital	0,511	0,5615
		Business Environment	0,5631	0,6049
		Institutional System	0,3854	0,5006
		Financial system and Macroeconomic indicators	0,4681	0,5302
Bahrain	4,2-4,3	Infrastructure	0,5436	0,629
		Human Capital	0,5063	0,6458
		Business Environment	0,5329	0,589
		Institutional System	0,562	0,4884
		Financial system and Macroeconomic indicators	0,6442	0,5149
Hungary	3,4-4,4	Infrastructure	0,2371	0,4527
		Human Capital	0,4807	0,602
		Business Environment	0,5949	0,6107
		Institutional System	0,745	0,5373
		Financial system and Macroeconomic indicators	0,642	0,5758

Vietnam. The indicator "Government budget balance" improved in 8 out of 9 countries, except for Algeria.

To conclude, the main difference between group 2,2 and 2,3 countries and group 3,2 and 3,3 countries is Business Environment. In 7 of 9 countries that moved from groups 2,2 and 2,3 to groups 3,2 and 3,3 from 2006 to 2018 also improved "Institutional System", analysis by indicator suggests that the main indicators for transition are more trustworthy and incorruptible institutional system, effective taxation, better education, and developing better infrastructure to provide comfortable living conditions.

Transition 3,2 and 3,3 to 4,2; 4,3 and 4,4: According to the Average analysis, the difference between groups 3,2; 3,3 and groups 4,2; 4,3, and 4,4 was in such indicators as Infrastructure, Human Capital, Business Environment, Institutional System, Financial System and Macroeconomic indicators.

11 countries moved from group 3,2: 3,3 (4,1) to group 4,2, 4,3, 4,4. These are countries including Chile, Uruguay, Panama, Croatia, Lithuania, Poland, Slovakia, Saudi Arabia, Bahrain, Kuwait, and Hungary. 9 out of 11 countries showed improvement in Human Capital, 8 out of 11 countries improved Business Environment, 7 out of 11 countries showed growth in Infrastructure, 6 out of 11 countries improved in Financial System and 4 out of 11 countries showed growth in Institutional System.

The most notable improvements in all groups of countries were in the Financial System and Macroeconomic indicators. Comparing between groups very different indicators: Government budget balance, (% GDP) improved in 7 countries such as Chile, Croatia, Hungary, Kuwait, Panama, Poland, Slovakia; Gross national savings, (% GDP) indicator in 7 countries: Chile, Croatia, Hungary, Kuwait, Panama, Poland, Saudi Arabia; and Investment Freedom indicator improved in 9 countries out of 11 such as Bahrain, Chile, Croatia, Hungary, Kuwait, Lithuania, Poland, Saudi Arabia, Uruguay.

The Business Environment indicator "Imports and Exports as a percentage of GDP" improved in 6 countries such as Chile, Croatia, Hungary, Lithuania, Panama, and Poland, and the indicator Total tax rate, (% profits) improved in 7 countries such as Chile, Croatia, Hungary, Panama, Poland, Slovakia, Uruguay. Also, the group of countries moved from group 3,2; 3,3 (4,1) to group 4,2; 4,3; 4,4 from 2006 to 2018.

Also in the Human Capital indicator, the "Quality of the education system" has improved, and consequently, the "Tertiary education enrolment" indicator has increased in eight countries except Kuwait, Slovakia, and Saudi Arabia. The Health Infrastructure indicator improved in only two countries, such as Poland and Croatia.

At the same time, the infrastructure indicator significantly improved such indicators as "Individuals using the Internet" in 9 countries, and "Fixed broadband Internet subscriptions/100 pop" in 8 countries. The indicators "Quality of overall infrastructure", and "Quality of roads" have improved in five countries, including Croatia, Hungary, Lithuania, Panama, and Poland. "Quality of electricity supply" - Bahrain, Hungary, Lithuania, Panama, Poland. Institutional system the indicator "Control of Corruption» have increased in 6 countries,

Government Integrity in 5 countries, «Legal rights index» indicator in 3 countries. In summary, the difference between the countries of these groups by analysis of the indicators suggests that the transition from one group to the other is contributed by a better financial system, Institutional System, as well as improvements in infrastructure indicators of increased quality of the Internet, and the improvement in the quality of education.

Conclusion

To summarize our work, we confirm the thesis that the following indicators must be improved and developed to move from one group to another. The Business Environment Financial System and Macroeconomic indicators are important for the transition from Group 1 to Group 2. The transition of countries from Group 2 to Group 3 is conditioned by the development of Infrastructure, Human Capital, Business Environment, Institutional System, Financial System and Macroeconomic indicators. The transition from group 3 to group 4 includes the improvement of such indicators as Financial System, Infrastructure, and Human Capital.

Existing research to date and the theory of scientists, confirm the fact that the above-mentioned indicators are interrelated, and their improvement has a significant impact on the transition of countries from one group to another. Thus, contributing to ensuring a higher level of development of the country. as well as economic, social, and political progress.

Also, in the execution of this study, the comparison methodology was described, in which we focused on the similarity of the elements. In the process, we tried to pull out the greatest number of similar elements, as well as write out group indicators and the difference between them. We also did not have access to all the data, a lot of countries are not represented the correlation between indicators. Ideally, since these indicators (infrastructure, institutions, etc.) can influence each other, our simple method is only suitable for preliminary analysis, for more in-depth analysis we need to use machine learning, which will allow us to determine the necessary indicators and values more precisely.

As mentioned, we did not have access to all indicators and countries. All the data were taken from the official website of the World Bank.

Thus, we analysed 5 elements (Infrastructure, Human Capital, Business Environment, Institutional System, Financial System and Macroeconomic indicators) in total, which amounted to 431 indicators, also 109 countries were analysed. The data was taken from 2006 to 2018. Since the pandemic situation, it was not possible to give an accurate estimate, many indicators have fallen from 2020 to 2022. But we also have a table of country transitions from 1995 to 2018, in which we can trace the movement and development of countries during this period. In addition to the 25 countries that we use in this analysis for comparison, we would additionally use another 28 countries (Described in more detail in Appendix 3).

References

1. Solow, R. M. (1956). A contribution to the theory of economic growth. The quarterly journal of Economics, 70(1), 65-94. http://piketty.pse.ens.fr/files/Solow1956.pdf

2. Hausmann, R., Hidalgo, C. A., Bustos, S., Coscia, M., & Simoes, A. (2014). The atlas of economic complexity: Mapping paths to prosperity. Mit Press. https://growthlab.cid.harvard.edu/files/growthlab/files/atlas_2013_part1.pdf

3. Jin-Xiu, Z. H. A. O. (2019, January). An Empirical Study on the Impact of Technological Innovation on Economic Growth—Taking Shandong Province as an Example. In 4th Annual International Conference on Social Science and Contemporary Humanity Development (SSCHD 2018) (pp. 454-457). Atlantis Press. https://www.atlantis-press.com/proceedings/sschd-18/55912314

4. Srinivasu, B., & Rao, P. S. (2013). Infrastructure development and economic growth: Prospects and perspective. Journal of business management and Social sciences research, 2(1), 81-91. https://www.semanticscholar.org/paper/Infrastructure-Development-and-Economic-growth%3A-and-Rao-Srinivasu/13528881527ae784b6e7c3c29489bfbba995d3b6

5. Wilson, R. A., & Briscoe, G. (2004). The impact of human capital on economic growth: a review. Impact of education and training. Third report on vocational training research in Europe: background report. Luxembourg: EUROP, 23. [PDF] The impact of human capital on economic growth: a review | Semantic Scholar

6. Acemoglu, D., Johnson, S., & Robinson, J. A. (2005). Institutions as a fundamental cause of long-run growth. Handbook of economic growth, 1, 385-472. C:\Working Papers\10481.wpd (nber.org)

7. van Stel, A. J., Carree, M. A., & Thurik, A. R. (2004). Papers on Entrepreneurship, Growth and Public Policy. The effect of entrepreneurship on national economic growth: An analysis using the GEM database (No. 3404). https://www.semanticscholar.org/paper/The-effect-of-entrepreneurship-on-national-economic-Stel-Thurik/798eddde0e0aeaded85d7ac983d02441bdf623a3

8. Levine, R. (1997). Financial development and economic growth: views and agenda. Journal of economic literature, 35(2), 688-726. https://documents1.worldbank.org/curated/en/194291468766487705/pdf/multi-page.pdf

9. Ishengoma, E. K., & Kappel, R. (2011). Business environment and growth potential of micro and small manufacturing enterprises in Uganda. African Development Review, 23(3), 352-365. https://www.ssoar.info/ssoar/bitstream/handle/document/72461/ssoar-afrdevr-2011-3-kappel_et_al-Business_Environment_and_Growth_Potential.pdf;jsessionid=5A9FF8423DFC742B696A0427E96B29F4?sequence=1

10. (2010). Measuring national income and growth in resource-rich, income-poor countries. https://documents1.worldbank.org/curated/en/770431468164637942/pdf/562970WP0Box349501B01PUBLIC10EP28.pdf

11. Varsakelis, N. C. (2006). Education, political institutions and innovative activity: A cross-country empirical investigation. Research Policy, 35(7), 1083-1090. https://www.sciencedirect.com/science/article/abs/pii/S0048733306001181?via%3Dihub

12. Zaidi, S. A. H., Wei, Z., Gedikli, A., Zafar, M. W., Hou, F., & Iftikhar, Y. (2019). The impact of globalization, natural resources abundance, and human capital on financial development: Evidence from thirty-one OECD countries. Resources policy, 64, 101476. https://www.sciencedirect.com/science/article/abs/pii/S0301420719304611?via%3Dihub

13. We, Zh. (2011). Mechanism of Human Capital Effecting on Economic Growth. https://www.semanticscholar.org/paper/Mechanism-of-Human-Capital-Effecting-on-Economic-We

/072cf713b0755baaddcb1c0a9c8046bc81b198d6

14. Easterly, W., & Levine, R. (2003). Tropics, germs, and crops: how endowments influence economic development. Journal of monetary economics, 50(1), 3-39. Tropics, germs, and crops: how endowments influence economic development - ScienceDirect

15. Nye, H.L., Reddy, S.G., & Watkins, K. (2002). Dollar and Kraay on 'Trade, Growth and Poverty': A Critique. Columbia University. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=18e9120e149cb77e8b88c57f92011393e41f245f

16. Hernandez, F. M., & Wright Jr, J. W. (2015). Determining Human Capital Impacts on Economic Growth. Journal of Economics and Sustainable Development, 6(6). Determining Human Capital Impacts on Economic Growth | Semantic Scholar

17. Rioja, F., & Valev, N. (2014). Stock markets, banks and the sources of economic growth in low and high income countries. Journal of Economics and finance, 38, 302-320. Stock markets, banks and the sources of economic growth in low and high income countries | SpringerLink

18. Sacchetto, C., Logan, S., Asare, J., & Saab, M. (2021). Timor-Leste's drivers of growth and sectoral transformation. https://www.theigc.org/sites/default/files/2021/06/Policy-paper-Timor-Lestes-drivers-of-growth-and-sectoral-transformation.pdf

19. Werker, E. (2013). Learning from double-digit growth experiences. International Growth Centre. https://www.theigc.org/sites/default/files/2012/03/Werker-2012-Working-Paper.pdf

20. Hausmann, R., Klinger, B. (2008). Structural Transformation in Pakistan, Growth Lab at Harvard's Center for International Development. https://growthlab.cid.harvard.edu/sites/projects.iq.harvard.edu/files/growthlab/files/41661-01-pak-tacr.pdf

21. Barrios, D., Taniparti, N., Hausmann, R., Brenot, C., Soylu, C., El Houda, R., ... & Henn, S. (2023). A Growth Diagnostic of Kazakhstan (No. 427). Center for International Development at Harvard University. https://growthlab.cid.harvard.edu/sites/projects.iq.harvard.edu/files/growthlab/files/2023-02-cid-wp-427-kazakhstan-growth-diagnostic.pdf

22. Hausmann, R., Deep, A., Di Tella, R., Frankel, J., Lawrence, R., Rodrik, D., & Velasco, A. (2011). Growth and Competitiveness in Kazakhstan: Issues and Priorities in the Areas of Macroeconomic, Industrial, Trade and Institutional Development Policies. CID Working Paper Series. https://growthlab.cid.harvard.edu/sites/projects.iq.harvard.edu/files/growthlab/files/kazakhstan_strategy_and_policy_2005.pdf

23. Preston, J., Viertel, E., Nielsen, S.P., & Parkes, D.L. (2004). The impact of human capital on economic growth: a review. [PDF] The impact of human capital on economic growth : a review | Semantic Scholar

24. Scully, G. W. (1988). The institutional framework and economic development. Journal of Political Economy, 96(3), 652-662. Accept Terms and Conditions on JSTOR

25. O'Brien, T., Nedelkoska, L., & Frasheri, E. (2017). What is the Binding Constraint to Growth in Albania. Center for International Development, Harvard University. https://growthlab.cid.harvard.edu/sites/projects.iq.harvard.edu/files/growthlab/files/alb_growth_diagnostic_report.pdf

26. Hausmann, R., Santos, M., Barrios, D., Taniparti, N., Tudela, J., & Lu, J. (2022). The Economic Complexity of Namibia: A Roadmap for Productive Diversification. CID Working Paper Series. https://growthlab.cid.harvard.edu/sites/projects.iq.harvard.edu/files/growthlab/files/2022-03-cid-wp-410-namibia-economic-complexity-report.pdf

27. Hausmann, R., Bustos, S. (2012). Structural transformation in Egypt, Morocco and Tunisia: A comparison with China, South Korea and Thailand. pp. 15-62 Banque africaine de développement African Development Bank https://www.afdb.org/sites/default/files/documents/projects-and-operations/comparative_study_on_export_policies_in_egypt_morocco_tunisia_and_south_korea.pdf

28. (2018). Sri Lanka Growth Diagnostic Executive Summary, Growth Lab at Harvard's Center for International Development. https://growthlab.cid.harvard.edu/sites/projects.iq.harvard.edu/files/growthlab/files/growth_diagnostic_executive_summary.pdf

29. Hausmann, R., Lim, E., & Spence, A. M. (2006). China and the global economy: medium-term issues and options-a synthesis report. CID Working Paper Series. https://growthlab.cid.harvard.edu/sites/projects.iq.harvard.edu/files/growthlab/files/126.pdf

30. Hausmann, R., Goldstein, P., Grisanti, A., O'Brien, T., Tapia, J. A., & Santos, M. A.

(2020). A roadmap for investment promotion and export diversification: The case for Jordan. CID Working Paper Series. https://growthlab.cid.harvard.edu/sites/projects.iq.harvard.edu/files/growthlab/files/2020-01-cid-wp-374-roadmap-jordan-revised-march.pdf

31. Hausmann, R., O'Brien, T., Santos, M. A., Grisanti, A., Kasoolu, S., Taniparti, N., Tapia, J., Villasmil, R. (2019). Jordan: The elements of a growth strategy. CID Working Paper Series. https://growthlab.cid.harvard.edu/sites/projects.iq.harvard.edu/files/growthlab/files/2019-02-28-cid-wp-346-jordan-growth-strategy-revised.pdf

32. Hausmann, R., Rodríguez-Clare, A., Rodrik, D. (2005). Towards a Strategy for Economic Growth in Uruguay. Inter-American Development Bank. https://growthlab.cid.harvard.edu/sites/projects.iq.harvard.edu/files/growthlab/files/towards-strategy-economic-growth-uruguay.pdf

33. Hausmann, R., Rodrik, D., Benavente, J. M., & Rodríguez, F. (2005). Self-Discovery in a Development Strategy for El Salvador [with Comments]. Economía, 6(1), 43-101. https://growthlab.cid.harvard.edu/sites/projects.iq.harvard.edu/files/growthlab/files/discovering-el_salvador-production-potential.pdf

34. Boudreaux, Ch., Caudill, S. (2019). Entrepreneurship, Institutions, and Growth: Does the Level of Development Matter https://home.fau.edu/cboudreaux/web/Institutions%20Entrepreneurship%20and%20Growth%20Working%20Paper.pdf

35. Bilan, Y., Mishchuk, H., Samoliuk, N., & Grishnova, O. (2019). ICT and economic growth: Links and possibilities of engaging. Intellectual Economics, 13(1), 93-104. https://kazguu-my.sharepoint.com/personal/a_aituar_kazguu_kz/_layouts/15/onedrive.aspx-?id=%2Fpersonal%2Fa%5Faituar%5Fkazguu%5Fkz%2FDocuments%2FВложения%2Filonab%2C%2BIE%2D2019%2D13%2D1%2D7%2Epdf&parent=%2Fpersonal%2Fa%5Faituar%5Fkazguu%5Fkz%2FDocuments%2FВложения&ga=1

36. World Bank. (2021). World bank group - international development, poverty, & sustainability. World Bank. https://www.worldbank.org/en/home

37. Elicit.org. (2023). https://elicit.org

38. Methodology. (n.d.). BTI 2022. https://bti-project.org/en/methodology

39. IMD World Competitiveness Online. (2019). Imd.org. https://worldcompetitiveness.imd.org/

40. World Bank. (2021). Worldwide Governance Indicators | DataBank. Worldbank.org. https://databank.worldbank.org/source/worldwide-governance-indicators#

41. World Justice Project. (2022). WJP Rule of Law Index. Worldjusticeproject.org. https://worldjusticeproject.org/rule-of-law-index/global

42. Economic Data and Statistics on World Economy and Economic Freedom. (n.d.). Www.heritage.org. https://www.heritage.org/index/explore?view=by-region-country-year

43. Doing Business | DataBank. (n.d.). Databank.worldbank.org. https://databank.worldbank.org/source/doing-business

44. Human Capital Index | DataBank. (n.d.). Databank.worldbank.org. https://databank.worldbank.org/source/human-capital-index

Does FDI affect GDP in Kazakhstan?

Adelya Issayeva, Inkar Mars, Nurassem Aidos

Abstract

This research aims to analyze the relationship between Foreign Direct Investment (FDI) and Gross Domestic Product (GDP) in Kazakhstan. As FDI is considered one of the accelerators of economic growth and the importance of attracting more foreign investments is one of the key topics for any country, we are keen to analyze it deeply. To test the effect of FDI on GDP in Kazakhstan and the hypothesis states that FDI positively affects GDP, we built an economic model and used time series data starting from 1991 until 2021 reported by the Bureau of National Statistics on GDP, FDI, Labor Force and Gross Capital Formation. Our results and findings demonstrate that FDI does not have a significant impact on GDP, however, Gross Capital Formation significantly affects GDP, which means that it plays a vital role in economic development in Kazakhstan. Based on the analysis made, the hypothesis that FDI has a significant effect on

Kazakhstan's GDP is not confirmed. Possibly, the effect of FDI on GDP is more complicated and, for example, routes via gross capital formation.

Introduction

In 2020 at the Kazakhstan Global Investment Roundtable president Kassym-Jomart Tokayev declared that our country must keep attracting foreign investment to establish a favourable and profitable environment for businesses by allowing domestic organizations to develop. The importance of Foreign Direct Investments for the economy of the country is a well-known fact from first sight. However, we are interested to understand whether FDI indeed has an impact on GDP in Kazakhstan.

Foreign Direct Investments (FDI) indicates investment made to the economy of a country by a company or individual from another country. Foreign direct investment assumes a long-term relationship between the person or nation who invests and the company or project in which the financial contribution is made. In most cases, the investor actively manages the investment and frequently acquires a controlling interest in the enterprise.

Currently, there is a consensus in the scientific literature that the growth of a country's involvement in international trade, as well as the attraction of capital in the form of foreign direct investment (FDI), leads to various positive effects for it in the long run. The positive effects of trade openness are an increase in the diversity and accessibility of goods for the population, increased competition in the markets, benefits from the country's specialization in goods of its comparative advantage, etc. Positive effects from inflows of foreign direct investment into the country are associated with the growth of GDP, a decrease in unemployment, an increase in tax revenues to the budget, etc., as well as various indirect effects: technology transfer, an introduction of advanced production and management practices by foreign companies, improving the quality of goods, etc.

Meanwhile, the character of the relationship between the flows of foreign direct investment and international trade in the modern economy is not unambiguous: FDI and international trade can both replace or complement each other. In addition, under different conditions, changes in trade can lead to changes in incoming and outgoing FDI flows, and, conversely, changes in FDI flows can lead to changes in the exports and imports of a country.

The existing theoretical approaches to the study of foreign direct investment are not fully suitable for describing the processes existing in the world economy, since they mainly consider two types of foreign direct investment: horizontal (aimed at finding a market) and vertical (aimed at finding resources). Other things being equal, the first type of investment is a substitute for international trade, and the second leads to an increase in international trade. At the same time, in the real economy, the flows of imports, exports and FDI have a significantly more complex nature and do not fully fit into the system of assumptions of theoretical models. Consequently, to gain knowledge about the mutual influence of the considered indicators in the real economy, it is necessary to conduct an empirical study.

The goal of this research is an analysis of the effect of foreign direct investment flows on the GDP of Kazakhstan. To identify the relationship between these two variables there was conducted a time series study using annual data for 1992-2021. In the remaining part of the research, theoretical approaches to explaining the economy of Kazakhstan, FDI by sectors and countries are consistently presented, an econometric model and research hypotheses are formulated, and the methodology and results of the regression model are presented. In conclusion, suggestions are made on possible directions for further research.

Economy of Kazakhstan

Kazakhstan is a tremendous country located in central Asia. In the development of the economy, several factors such as the number of natural resources, geographic features, and policies, played a significant role. Government policies, such as the deregulation of industries and liberalization of trade, were essential steps in the development of the economy. Every reform created fortunate circumstances for the further development of the country. One of the opportunities was the attraction of foreign direct investment (FDI), especially in the oil and gas sector.

Foreign direct investment has an enormous contribution to the growth of Kazakhstan's economy. To become a favourable country for investments, the government provided tax benefits, constructed economic zones, and

enriched the investment climate. Investments in global companies such as Chevron, ExxonMobil, and Total have enhanced the oil and gas sector of the country. It has led to an expansion of FDI in the mining sector. Nowadays, Kazakhstan is attracting FDI to further industries, including manufacturing, services, and infrastructure. The majority of Kazakhstan's GDP is the service sector making up 57%, industry at 37%, and agriculture at 6%. The World Bank estimates that the country's GDP was roughly $197.1 billion in 2021, and the per capita income was $10,374. The nation had an 8% of inflation rate and a 4,3% of unemployment rate in 2021. Crude oil, natural gas, and metals are the principal export commodities, while China, Russia, and Italy are the nation's top trading partners. Notwithstanding Kazakhstan's economic growth, the nation still faces several obstacles, such as its high reliance on natural resources and susceptibility to world commodities market shocks. As a result, Kazakhstan has realized that its economy has to be more diverse and less dependent on the oil and gas industry. The nation has taken initiatives to stimulate investment in several key areas for economic diversification, including agriculture, manufacturing, and tourism. Moreover, due to external reasons like the COVID-19 pandemic and declining oil prices,
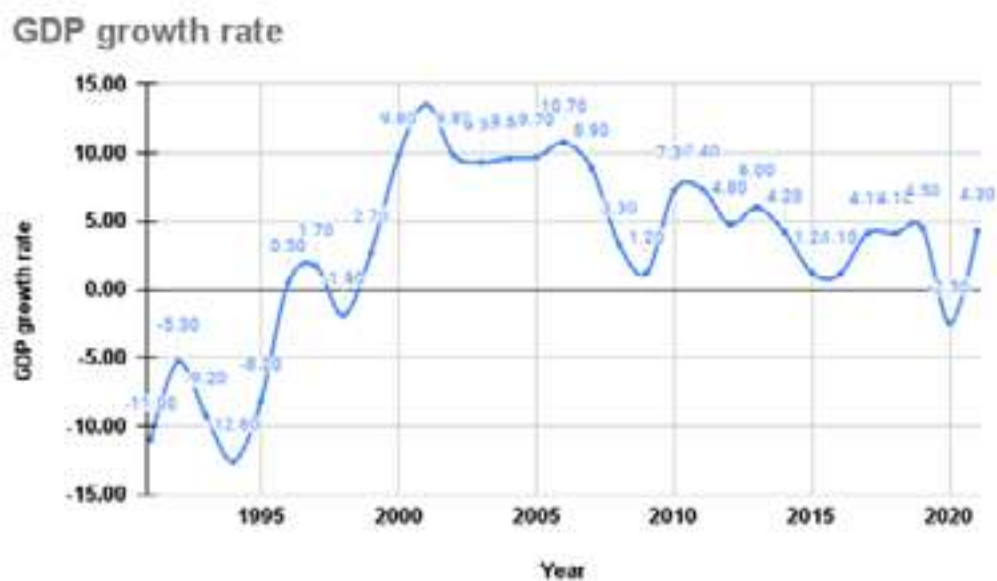
Figure 1. GDP growth rate (from [worldbank.org)](worldbank.org)

Kazakhstan's economy has recently encountered severe difficulties. The pandemic has had a significant negative effect on the economy of the nation, which decreased GDP by 2.5% in 2020. Nevertheless, the country was able to recover up to 4.3% of GDP in 2021. The low oil prices are another reason why governments' revenue decreased. Despite these challenges, the government considered a variety of ways to develop and boost the economy, like tax breaks, infrastructure projects, and stimulus packages.

Since gaining independence, Kazakhstan's economy has experienced remarkable growth because of favourable external conditions (long-term growth in oil and other commodities prices), a variety of macroeconomic policies and structural changes meant to foster expansion, diversify the economy, and attract foreign direct investment (FDI). The country's future goals include entering the top 30 industrialized nations by 2050.

FDI in Kazakhstan

There have been a series of reforms in Kazakhstan to open its economy and modernize its production structure since independence. Kazakhstan has implemented economic changes, such as the liberalization of trade and investment regulations, special economic zones establishment, and the privatization of state-owned firms, specifically to draw in international investment. Several steps such as the stabilization of its macroeconomic climate, legal changes and regulatory policies have been taken in the country, after which the role of FDI started to enhance as well. As a result, it has emerged as one of Central Asia's most desirable locations for foreign investments. Several structural adjustments were made from the government side in recent years to attract

foreign investments. For instance, a council that coordinates efforts to draw FDI was created in 2019, and the management of the investment committee as well as managing foreign investors became under the supervision of the Ministry of International Affairs in 2019. As a centre for regional investments, the Astana International Financial Center (AIFC) was opened and now provides several advantages in terms of taxes, laws and other factors for foreigners that want to run a business in our country. Moreover, the AIFC is now the home of the Kazakhstan Direct Investment Fund, which was established by the government in 2019 to encourage economic diversification. AIFC legislation also became the centre for regulation of investment agreements between the countries which positively affects the stimulation of more foreign investments.

At the beginning of 1992, the country received significant investment from Western nations such as Germany, the United States and the United Kingdom. It was mainly directed towards the gas and oil industry, which is the backbone of our economy.

In 2010, Kazakhstan, Russia, and Belarus formed a customs union, followed by the creation of the Eurasian Economic Union in 2014, which also included Kyrgyzstan and Armenia. The EAEU is governed by the Eurasian Economic Commission, based in Moscow, to deepen, and strengthen economic integration and promote the free movement of goods, people, and capital among member countries. After this cross-border economic cooperation, Kazakhstan received increased investment from Russia, Ukraine, Belarus, and Uzbekistan.

Nowadays, according to Kazakh Invest, the top ten investing countries in Kazakhstan in 2022 were:

Table 1. FDI inflow to Kazakhstan (billion US dollars) (from invest.gov.kz)

1	Netherlands	8.1
2	USA	5.1
3	Switzerland	2.8
4	Belgium	1.6
5	Russia	1.5
6	South Korea	1.5
7	China	1.4
8	France	770 million
9	United Kingdom	661 million
10	Germany	469.5 million

The Netherlands is a top international investor, as can be seen from the table. In 2022, the investment indicators accounted for 8.1 billion dollars. The Netherlands since the independence of Kazakhstan is one of the active investors, with overall investments reaching approximately $110 billion. The number of Dutch companies operating in Kazakhstan is more than 900. The leading role of the Netherlands in the world FDI is explained by its policy attracting tax-evading companies from all over the world (Weyzig, 2013). The USA stands second, with $5.1 billion in investments. Third place goes to Switzerland, investments amounted to $2.8 billion. Three countries accounted for 59% of total FDI inflows in Kazakhstan.

In the last year, the FDI inflow to Kazakhstan reached 28 billion US dollars, which is in comparison with 2021 (23.8 billion dollars) higher with an increase of 17,7%. In the last 10 years, this indicator has set records (28.9 billion dollars in 2012). In 2022, the majority of FDI inflows to Kazakhstan came from a few key countries, including the Netherlands, Switzerland, and the United States. The main sectors attracting FDI in Kazakhstan in 2022 are shown in Table 2.

Table 2. Main sectors attracting FDI inflows in 2022 (billion US dollars) (from invest.gov.kz)

1.	Mining	12.6
2.	Manufacturing	5.6
3.	Wholesales and retail trade	5.1
4.	Professional, scientific, and technical activities	1.2
5.	Transport and warehousing	1.2

The expansion of the national economy in Kazakhstan demonstrates the effect of FDI on GDP. The World Bank estimates that between 2000 and 2013, Kazakhstan's GDP increased at an average annual rate of 8.4%, partly due to high oil prices and strong FDI inflows. Over the past decade, FDI inflows in Kazakhstan have shown significant fluctuations, with peaks in 2011 (26.4 billion dollars), 2012 (28.9 billion

dollars) and 2022 (28 billion dollars). However, as a result of global economic turmoil and low oil prices, GDP growth has slowed down since 2014. However, starting in 2016, the dynamics of FDI recovered and grew, reaching its peak in 2022.

Gross Inflow FDI in Kazakhstan

Figure 2. Gross Inflow FDI in Kazakhstan (from nationalbank.kz)

In Kazakhstan, mergers and acquisitions type of FDI is more popular and important, but there has been a trend in 2015, 2016 and 2017 where FDI flows decreased in the cross-border shares and new projects. But still, FDI flows remained positive compared to other CIS countries in Kazakhstan and continued to make a greater impact on the economy. According to the National Statistical Agency of Kazakhstan, the share of foreign companies operating in the country currently accounts for 6.6% of total employment, 66.2% of exports and 61% of the country's industrial production.

According to the data, it can be seen that the recent economic history of Kazakhstan has been significantly influenced by foreign direct investment (FDI). FDI flows also fluctuated, because of the consequences of the global prices and the decline in world commodity prices it was challenging to attract investments. Despite this fact, international companies continue to invest in Kazakhstan. According to the 2016 EY report, business surveys show that Kazakhstan is still a desirable place to invest and attracts many international foreign players. Also, the growth of FDI inflows to Kazakhstan in recent years proves that the country is still an attractive destination for investments. FDI by sectors

According to the Central Asian Bureau for Analytical Reporting, the mining sector continued to be the most attractive for investors on a sectoral level. The mining sector drew a record amount of investments in 2019 before the pandemic, totalling $ 13.7 billion, in 2020 the amount of financing fell by 40% to $ 8.2 billion. The reason for such a decrease was a structural modification, where FDI inflows into crude oil and natural gas fell by 47%, while investments in the production of coal and lignite decreased by 51%. However, FDI inflows into the mining and quarrying industry's technical services operations increased by 20%, and other businesses in this industry also saw a significant increase. The majority of FDI in the mining sector was connected to a large-scale American project in Tengiz operated by Chevron, which is anticipated to be completed by 2022, according to the UNCTAD World Investment Report for 2021. The mining industry had 56% of the total gross inflow of FDI.

The second most appealing industry for investment is manufacturing, which takes 8% of the FDI inflow in 2021. Investments in the manufacturing sector are considered a priority for the development of Kazakhstan's economy. However, financing in this industry fell by 9% overall in 2020 and totalled USD 3.16 billion. The production of food, drinks, and tobacco products

had a 50% increase in FDI inflows, as did the production of textiles, coke, and refined petroleum products. These increases were all significantly higher than they were the year before. Production of machinery and equipment outside of the other categories, as well as electrical equipment, saw a substantial decline in FDI inflows.

At the end of 2020, FDI inflows to Kazakhstan's wholesale and retail trade, auto and motorcycle repair, and financial and insurance activities totalled over 1.0 billion USD, to transportation and warehousing - 0.87 billion USD, and to agriculture, forestry, and fisheries - 12.6 million USD. These sectors accounted for 15% of Kazakhstan's total FDI in 2020. The FDI inflow to the country in 2020 fell significantly in four different sectors: professional, scientific and technical activities (by 60%), real estate activities (2.1 times), and construction (by 26.8%). It is important to note that the decline in FDI inflows in

the information and communications sector was offset by an increase in foreign direct investments, which attracted 214 million USD, or 68% more FDI than the previous year. In 2020, Kazakhstan launched 41 investment projects worth 1.6 billion USD with international involvement. Construction firms from Turkey YDA Holdings and Sembol Construction and Engineering, an electricity company from France Total Eren, an engineering organization from Germany Linde Group, Dutch venture capital fund Food Ventures, and an automaker from South Korea HYUNDAI were among the major foreign investors. Nine projects totalling 665 million USD were launched in the first quarter of 2021. These include initiatives in the fields of tourism, oil and gas, metallurgy, construction material production, and alternative energy. Another 36 projects totalling 4.4 billion USD are anticipated to be commissioned before the end of the year.
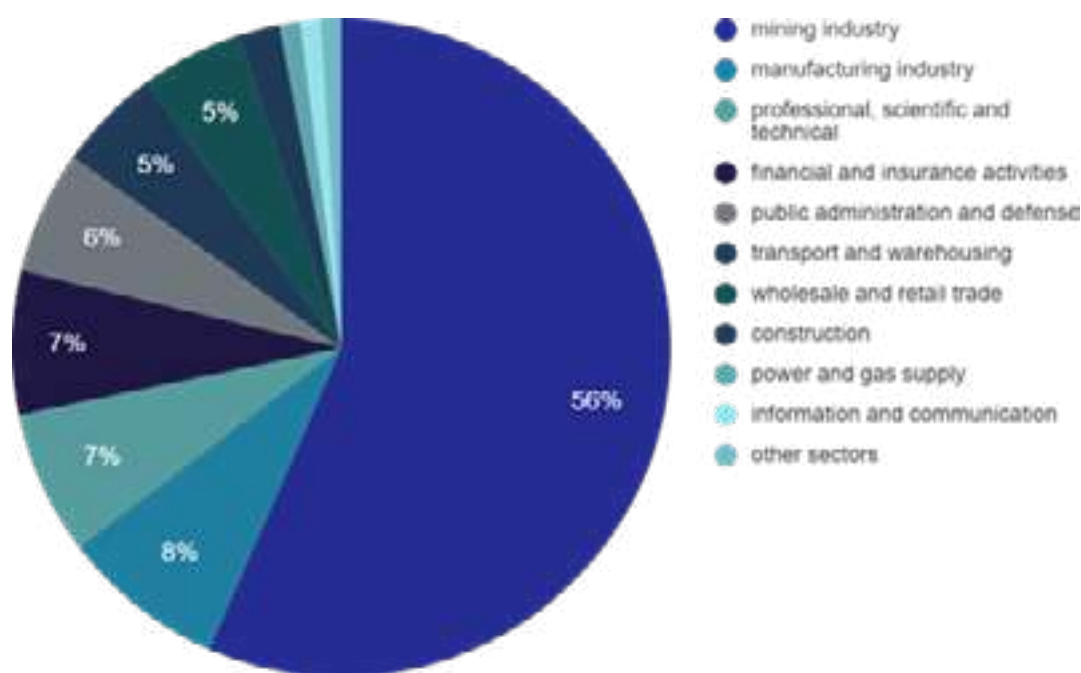

Figure 3. FDI by sectors in 2021 (from cabaret.asia)

Literature review

Nistor (2014) explored how FDI affects GDP in Romania. He examined whether FDI inflows affected the GDP in the Romanian economy using data from the World Bank for the years starting from 1990 to 2012. The results revealed that FDI inflows have a significant influence on GDP, with a coefficient of 2.299. Nistor concluded that FDI can be considered a factor that accelerates the economic, market, and technological growth of a country and contributes to its future development.

Abbes, Mostefa, Seghir, and Zakarya

(2015) used cross-country studies of 65 countries taken from the United Nations Conference on Trade and Development database from 1980 to 2010 to test the relationship between economic growth and FDI. They analyzed the relationship between the FDI and GDP variables using the co-integration approach. As a consequence, they detected that all computed coefficients show that FDI is positively and strongly connected with economic growth at the 1% level. Overall, the results of the FDI and growth regression showed a substantial long-term link between both, as

well as the significance of FDI for economic development in the countries that they studied.

Haider, Ahmad, Anwar, and Iqbal (2013) used the Cobb-Douglas production function to examine the influence of FDI on GDP in Pakistan. They gathered time series data from the State Bank of Pakistan and the World Bank for 1982-2012, including FDI, GDP, capital formation, labour force, and trade openness. From the analysis made, the authors determined that FDI is positively correlated with GDP, but they also discovered that FDI has a bigger impact on GDP in export-oriented countries than in import-substitution economies. The authors proposed that Pakistan's economic growth potential is determined by its aptitude to draw FDI, and the extent to which FDI impacts GDP is determined by its trade policy regime, for instance, by the export policy regime.

Susic, Stojanovic-Trivanovic and Susic (2016) found that FDI has different effects on macroeconomic variables in Bosnia and Herzegovina in a positive way. Their research reveals that FDI has a triple impact on economic development; firstly, it enhances the domestic investment rate, secondly, it increases business efficiency by introducing new technologies and knowledge and finally, it inspires local competitors to innovate, leading to the production of diverse high-quality goods.

Boresztein, De Gregorio and Lee (1998) focused on the impact of foreign direct investment on economic growth. They used information on FDI flows from industrial countries to 69 developing countries over the past 20 years to study the relationship between FDI and the development of the economy. According to their research, FDI is a key technology transfer medium and contributes to growth more than domestic investment. Moreover, researchers found that there is a correlative effect between foreign direct investments and human capital. The effectiveness of FDI on the economy only holds if the host economy can employ advanced technologies.

Rakhmatullayeva, Khajiyeva, and Abduraimov (2021) examined the attractiveness of Foreign Direct Investment in Kazakhstan since independence. From 1991 to 2021, they conducted macroeconomic analyses of data on the dynamics of countries' GDP and the cyclical nature of the national economy. They found that despite the overall decrease of FDI inflows to CIS countries, the inflow to Kazakhstan increased by 35%, because of the two main large projects:

the airport terminal with an investment of 244 million U.S dollars and rubber and plastic products with $192 million investment. Overall, based on their analysis, they recommended that an effective investment policy is significant to constantly improve the investment climate and FDI attraction to the country.

Lee, Baimukhamedova, and Akhmetova (2010) examined the connections between Kazakhstan's economic development, currency rate, and foreign direct investment (FDI). In this research, fixed capital investment, employment ratio, retail trade turnover, industrial production, FDI inflows, and dollar exchange rate are examined. They used a multivariate regression model with weighted least squares estimates covering ten years from 1997 to 2006. The researchers demonstrated that FDI has a statistically insignificant effect on Kazakhstan's GDP growth. To be precise, according to the results, resource-based FDI may not give a huge impact on growth as manufacturing-based FDI. That is why their recommendation was to reconsider the strategic objectives of FDI.

Ibhagui (2020) conducted a threshold analysis to examine how FDI impacts Sub-Saharan Africa's economic development. He made use of a collection of panel data spanning the years 1985 to 2013 from 45 SSA (Sub-Saharan Africa) nations, including six variables: initial income, population growth, inflation, trade openness, human capital, and financial market development. The findings demonstrate that FDI occasionally fosters economic growth. For instance, when particular inflation rates, population expansion, and financial market expansion have been reached. The author also discovers that nations with greater levels of institutional quality, such as better governance and more effective legal systems, have bigger effects of FDI on economic growth.

Hansen and Rand (2006) looked at the causal links between FDI and growth in developing countries. They used heterogeneous panel data from 31 developing countries covering 31 years. Their findings show that FDI has a lasting effect on GDP, in the sense that FDI causes the development of the economy in developing nations. This effect is fueled by mechanisms like knowledge transfer and the adoption of technologies. Additionally, the researchers emphasized that a nation's gross capital formation had a long-term effect on the model for GDP and FDI.

Agrawal and Aamir Khan (2011) explored the

relationship between FDI and the economic development of China and India. To investigate the effect, the authors used data from 1993-2009 and generated modified growth models. They used GDP as a dependent variable and FDI, Human Capital, Labor Force and Gross Capital Formation as independent variables. According to the results, a positive effect on the growth of GDP in China is greater than in India. Moreover, the larger market size, highly developed infrastructure, and government stimulus were the main factors why investors prefer to invest in China rather than in India.

Hypothesis

In this research, we want to test how Foreign Direct Investment (FDI) affects Gross Domestic Product (GDP) in Kazakhstan. Based on a literature review provided in the previous section, FDI is expected to have a statistically significant positive effect on GDP. This hypothesis suggests that when a country attracts more FDI, it will lead to increased economic activity and growth, such as job creation and enlarged productivity, which leads to higher GDP.

Many factors can affect the relationship between FDI and GDP and it is complex. Therefore, this research attempts to test these hypotheses and to determine the strength and direction of the relationship between FDI and GDP.

Methodology

R Studio was used for data analysis to look at the relationship between Foreign Direct Investment (FDI) and Gross Domestic Product (GDP). A time-series study was conducted to examine the correlation between FDI inflows and GDP in Kazakhstan. To identify patterns and trends, the data was initially subjected to a descriptive analysis using R Studio. Subsequently, a regression analysis utilizing the Ordinary Least Squares (OLS) approach was performed to identify the connection between Kazakhstan's GDP and FDI inflows. Python tools such as pandas, numpy, and matplotlib were used to modify and display the data. Interactive visualizations were developed in R studio to present the findings. The econometric model used in this analysis is based on the Cobb-Douglas production function. The Cobb-Douglas production function is a popular economic model that explains the connection between production

inputs and outputs of commodities and services. The model is developed on the assumption that the output of a production process is governed by the quantities of labour and capital utilized in that process, in addition to a constant factor of technical advancement.

The production function expresses the link between inputs and outputs as a mathematical equation. The formula is commonly stated as $Y = A * K * L(1-\alpha)$, where Y stands for output, K for capital, L for labour, A represents the level of technology, and α is a parameter that determines the share of output that goes to capital versus labour. Since it offers a framework for comprehending the elements that lead to improvements in output and productivity over time, the Cobb-Douglas production function has been widely used in the examination of economic growth and development. The link between GDP and the factors fostering economic growth has been described using the Cobb-Douglas production function. Foreign Direct Investment (FDI) is another element that may have an impact on economic expansion. In the Cobb-Douglas production function framework, FDI may be viewed as an extra input element, in addition to labour and capital, that can support economic growth and boost output (GDP).

$$Y = \beta_0 + \beta_1 (K) + \beta_2 (L) + \beta_3 (FDI) + \varepsilon$$

Where Y = Gross Domestic Product

K = Gross Capital Formation

L = Labor Force

FDI = Foreign Direct Investment

Data collection

Time series data were collected from open credible sources such as the Bureau of National Statistics for the period from 1992 to 2021. We used statistics on the following variables for our analysis:

- GDP (current in KZT) - it is the economic performance of a country, commonly used as a broad measure of economic welfare.
- Labor force - it is the sum of employed and unemployed people in a country.
- Gross capital formation (current in KZT) - capital accumulation means the expansion of production, its increase due to additional costs for fixed capital (machinery, equipment,

buildings) and working capital (labour, raw materials). Generally speaking, the higher the capital development rate, the quicker an economy may raise its overall revenue.
-        FDI (in KZT) - it is an investment made from a foreign country to Kazakhstan.

Results and findings

OLS regression analysis

The OLS regression analysis examines the relationship between Gross Domestic Product (GDP) as the dependent variable and several independent variables, namely Gross Capital Formation, Labor Force, Foreign Direct Investment (FDI), and lagged GDP variables. The analysis is presented in three distinct models, each with different combinations of independent variables.

	Dependent variable:		
	GDP		
	(1)	(2)	(3)
Gross_Capital_formation	3.556***	3.853***	3.622***
	(0.278)	(0.357)	(1.091)
Labor_force	1.445	-7.432	-6.890
	(4.090)	(6.774)	(7.447)
FDI	-0.001	-0.001	-0.001
	(0.002)	(0.002)	(0.002)
FDI_lag_1		0.002	0.002
		(0.002)	(0.002)
FDI_lag_2		0.004*	0.003
		(0.002)	(0.002)
GDP_lag_1			-0.006
			(0.222)
GDP_lag_2			0.073
			(0.214)
Constant	-9,852,188.000	57,903,279.000	53,714,036.000
	(31,480,002.000)	(51,608,320.000)	(56,822,336.000)
Observations	30	28	28
R²	0.980	0.983	0.983
Adjusted R²	0.978	0.979	0.977
Residual Std. Error	3,704,450.000 (df = 26)	3,631,203.000 (df = 22)	3,797,389.000 (df = 20)
F Statistic	425.165*** (df = 3; 26)	250.033*** (df = 5; 22)	163.322*** (df = 7; 20)
Note:			*p**p***p<0.01

Figure 4. OLS Regression Results

The F statistic for Model 1 yielded a highly significant value of 425.165 (p < 0.01), indicating that the overall model is statistically significant with R-squared reaching 100%. This suggests that the variation in GDP over the years explained by the joint variation in all independent variables (Gross_Capital_formation, Labor_force, FDI) is significantly larger than the unexplained variation. Consequently, the model demonstrates a strong fit to the data, implying that the aforementioned independent variables collectively exert a substantive influence on GDP. Model (1) reveals that Gross Capital Formation exhibits a statistically significant positive relationship with GDP at a 1% level of significance. This implies that an

increase in Gross Capital Formation leads to an expansion of the economy. However, the coefficient of FDI is not statistically significant, suggesting that FDI does not exert a significant influence on GDP, as well as the Labor Force.

In Model 2, the F statistic attained a significant value of 250.033 (p < 0.05), albeit lower than that of Model 1. This result indicates that the enhanced model, which includes two more independent variables (FDI_lag_1 and FDI_lag_2), continues to be statistically significant. The lagged values of FDI for one and two years back are included to allow for a possible postponed effect of FDI. Indeed, FDI lagged to two years is statistically significant at a 5% level and positive suggesting that FDI probably has a

positive effect on GDP but two years later. The inclusion of lagged variables, in conjunction with those from Model 1, contributes significantly to the overall explanatory power of the model. In this model Gross Capital Formation retains its positive and statistically significant effect on GDP, providing further evidence that increased investment in physical capital contributes to economic growth. Conversely, the coefficient of the Labor Force variable is not statistically significant, indicating that variations in the labour force do not have a substantial impact on GDP. According to this model's R-squared, it has a value of 0.983, which is almost 98.3% of the changes in GDP that can be accounted for by the independent variables that were included.

For Model 3, the F statistic generated a value of 163.322 (p 0.01) which was statistically significant. even though it is less than Models 1 and 2. This indicates that Model 3, with the inclusion of lagged dependent variables to control for a possible autocorrelation (GDP_lag_1 and GDP_lag_2), provides a statistically meaningful fit to the data. The collective set of independent variables in this model significantly contributes to explaining the observed variation in GDP. Model (3) includes Gross Capital Formation, lagged FDI variables (FDI_lag_1 and FDI_lag_2), and lagged GDP variables (GDP_lag_1 and GDP_lag_2). The positive and statistically significant coefficient of Gross Capital Formation reaffirms its importance as a determinant of GDP. However, the lagged FDI variables do not exhibit statistical significance, suggesting that past levels of FDI do not significantly impact current GDP when lagged GDP is controlled for. Furthermore, the lagged GDP variables are not statistically significant, indicating that historical levels of GDP do not have a significant influence on current GDP. The R-squared value of 0.983 for Model (3) is consistent with the previous model, illustrating its ability to explain approximately 98.3% of the variations in GDP.

In conclusion, the results of the regression analysis show that the growth of the GDP is significantly influenced by gross capital formation. However, the Labor Force and FDI variables do not appear to have a significant impact on GDP. Additionally, the inclusion of lagged variables related to FDI and GDP does not provide any explanatory power for current GDP levels. These results advance our knowledge of the factors that influence economic expansion, highlighting the significance of physical capital investment for long-term economic growth.

Durbin-Watson test

The Durbin-Watson test findings indicate if there is autocorrelation or a correlation among a regression model's residuals. Autocorrelation suggests that there is a pattern or relationship among the residuals, which violates one of the assumptions of ordinary least squares (OLS) regression.

Figure 5. The Durbin-Watson test

Model	Lag	Autocorrelation	D-W Statistic	p-value	Alternative hypothesis
Model 1	1	0.1088243	1.762977	0.264	rho != 0
Model 2	1	-0.0142887	1.992052	0.572	rho != 0
Model 3	1	-0.0142887	1.992052	0.586	rho != 0

The table provides data on the models, the lag considered by the Durbin-Watson test, the autocorrelation coefficient, the D-W statistic, the p-value, and the alternative hypothesis being tested (rho!= 0 indicates the existence of autocorrelation). For the given results: Durbin-Watson Test for Model 1: The test reveals a Durbin-Watson (D-W) statistic of 1.763 and a p-value of 0.264. The D-W statistic measures the presence of first-order autocorrelation, with a value between 0 and 4. In this case, the D-W statistic is closer to 2, indicating a lack of first-order positive autocorrelation. The p-value of 0.264 suggests that there is insufficient evidence to conclude that there is significant autocorrelation in the residuals at the 5% significance level. Therefore, the model (Model 1) does not

exhibit significant first-order autocorrelation. Durbin-Watson Test for Model 2: The test yields a D-W statistic of 1.992 and a p-value of 0.572. The D-W statistic, again close to 2, implies a lack of first-order autocorrelation. The p-value of 0.572 supports this finding, indicating that there is no significant evidence of first-order autocorrelation in the residuals of the model (Model 2). Therefore, the model does not suffer from significant first-order autocorrelation. Durbin-Watson Test for Model 3: The test returns a D-W statistic of 1.992 and a p-value of 0.586. Similar to the previous result, the D-W statistic is close to 2, indicating the absence of first-order positive autocorrelation. The p-value of 0.586 further supports this observation, suggesting no significant evidence of first-order autocorrelation in the residuals of the model (Model 3). According to the findings of the Durbin-Watson test, the residuals of all three models do not significantly indicate any signs of first-order positive autocorrelation.

Conclusion

To conclude, the presented research was conducted to identify whether Foreign Direct Investments influence the GDP of Kazakhstan. To define the relationship between these two variables we used the yearly data taken from the national official website stat.gov.kz from 1992 until 2021. We used GDP as a dependent variable and Gross capital formation, FDI and Labor Force as independent variables in our first model, GDP as a dependent variable and Gross capital formation, Labor Force, FDI, FDI with a lag of one year and FDI with a lag of two years as independent variables in the second model, GDP as a dependent variable and Gross capital formation, Labor Force, FDI, FDI with a lag of one year and FDI with a lag of two years, GDP with a lag of one year and GDP with a lag of two years as independent variables in the third model. All estimated OLS regressions were tested for first-order autocorrelation with the Durbin-Watson test. According to the results, F-statistic is significant, Gross capital formation has a significant effect and Labor Force and FDI have a non-significant effect on GDP in three models, however, in Model 2 FDI lagged two years back is positive and statistically significant at a 5% significance

level. Thus, the FDI affects the GDP two years later. According to the results of the Durbin-Watson test, there is no significant evidence of positive autocorrelation which indicates that the assumption of no autocorrelation in the OLS regression is not violated, strengthening the reliability of the regression results. Finally, our hypothesis which states that FDI has a positive impact on the GDP of Kazakhstan is not directly confirmed. It could be that the effect of FDI on GDP is more complicated. Also referring to Lee, Baimukhamedova, and Akhmetova (2010), investigated that Foreign Direct Investment has a minimal impact on the economic growth of Kazakhstan. In addition, the data that was used may not be extremely accurate, because in 1991 statistics were not fully correctly formed and we have a limited period of 30 years from 1991 to 2021.

Bibliography

1. Abbes, S. M., Mostéfa, B., Seghir, G. M., & Zakarya, G. Y. (2015). Causal Interactions between FDI, and Economic Growth: Evidence from Dynamic Panel Co-integration. Procedia. Economics and Finance, 23, 276–290. https://doi.org/10.1016/s2212-5671(15)00541-9

2. Agrawal, G., & Khan, M. S. (2011). Impact of FDI on GDP: A Comparative Study of China and India. International Journal of Business and Management, 6(10). https://doi.org/10.5539/ijbm.v6n10p71

3. Borensztein, E., De Gregorio, J., & Lee, J. (1998). How does foreign direct investment affect economic growth? Journal of International Economics, 45(1), 115–135. https://doi.org/10.1016/s0022-1996(97)00033-0

4. Foreign Direct Investment. (n.d.). Ebrary. https://ebrary.net/1589/economics/foreign_direct_investment

5. Foreign direct investment, exchange rate, and their roles in economic growth of developing countries: Empirical evidence from Kazakhstan. (2010). Journal of international business research, 9.

6. Hansen, H., & Rand, J. (2006). On the Causal Links Between FDI and Growth in Developing Countries. The World Economy, 29(1), 21–41. https://doi.org/10.1111/j.1467-9701.2006.00756.x

7. Ibhagui, O. (2020). How does foreign direct investment affect growth in sub-Saharan

Africa? New evidence from threshold analysis. Journal of Economic Studies, 47(1), 149–181. https://doi.org/10.1108/jes-06-2018-0198

8. Inform.Kz. (2023, April 3). Uncovering growth and potential of foreign direct investments in Kazakhstan: a comprehensive analysis. Kazinform. https://www.inform.kz/en/uncovering-growth-and-potential-of-foreign-direct-investments-in-kazakhstan-a-comprehensive-analysis_a4051704

9. Iqbal, N., Ahmad, N., Haider, Z., & Anwar, S. (2013). Impact of Foreign Direct Investment (FDI) on GDP: A Case Study from Pakistan. International Letters of Social and Humanistic Sciences, 16, 73–80. https://doi.org/10.18052/www.scipress.com/ilshs.16.73

10. Kazakhstan. (n.d.). World Bank. https://www.worldbank.org/en/country/kazakhstan

11. Кубаева, Г. (2021, September 15). Foreign Direct Investment in Kazakhstan in 2020: Structure and Dynamics - CABAR. asia. CABAR.asia. https://cabar.asia/en/foreign-direct-investment-in-kazakhstan-in-2020-structure-and-dynamics

12. Nistor, P. (2014). FDI and Economic Growth, the Case of Romania. Procedia. Economics and Finance, 15, 577–582. https://doi.org/10.1016/s2212-5671(14)00514-0

13. OECD Investment Policy Reviews: Kazakhstan 2017. (n.d.). OECD Investment Policy Reviews | OECD iLibrary. https://www.oecd-ilibrary.org/finance-and-investment/oecd-investment-policy-reviews-kazakhstan-2017_9789264269606-en

14. Project Jupyter. (n.d.). Home. https://jupyter.org/

15. RStudio Desktop - Posit. (2023, March 16). Posit. https://posit.co/download/rstudio-desktop/

16. Susic, I., Stojanovic-Trivanovic, M., & Šušić, M. (2017). Foreign direct investments and their impact on the economic development of Bosnia and Herzegovina. IOP Conference Series, 200, 012019. https://doi.org/10.1088/1757-899x/200/1/012019

17. 2021 Investment Climate Statements: Kazakhstan. (2021, January 1). state.gov. https://www.state.gov/reports/2021-investment-climate-statements/kazakhstan

18. Rakhmatullayeva, D., Khajiyeva, A., & Abduraimov, O. (2021). Foreign direct investment in Kazakhstan: a success story over the years of independence of the republic. Farabi Journal of Social Sciences, 7 (4) https://doi.org/10.26577/cajsh.2021.v7.i4.01

Examining Country of Origin Effect Among Generation Z Consumers in Kazakhstan: A Study in the Home Appliance Industry

Dilnaz Aitzhanova, Lana Kim, Aigeirm Niyetbek, Dzhanel Nurgaliyeva

Abstract

This study examines the relationship between country of origin and product evaluation among Generation Z consumers in Kazakhstan in the home appliance industry. The objectives of the study are defined, and quantitative and qualitative designs of the study are used to collect data from convenience and snowball samples. A questionnaire was developed for consumers and the two-stage interview was conducted among HA shop assistants and customer respondents. Statistical analysis methods: Spearman's Rho correlation, percentage, and content analyses. The results indicated that the majority of respondents think that German and South Korean HA products are of higher quality than those from the other nations, while China and Russia's goods are associated with affordable prices and South Korean ones with innovative designs. These associations affect how customers rate similar products available on the market from various states. The article's conclusion outlines the limitations of the findings after a detailed result discussion. This research could help local and international businesses who operate in Kazakhstan to enhance their business strategies by providing a better knowledge of the impacts of COO on customer behavior.

1. Introduction

Until 1991, there was a shortage of goods (import, export) in Kazakhstan, which led to the fact that the supply of a wide range of consumer goods began to be limited (Ayagan, 2019). Based on Wellisz and Findlay (1986), at that time a large number of consumer goods were produced either in the USSR itself or in other countries with a communist regime, or they were bought on the illegal market. At the moment, Kazakh consumers have begun to encounter goods from various other countries, which can lead to the effect of the country of origin (COO). It is a phenomenon that information about the country of origin of goods has on the preferences and choices of the consumer.

The purpose of the study is to analyse the national impact on Kazakhstani consumers in order to study and understand the important elements in the decision-making process of consumers in the Republic of Kazakhstan. Generation Z clients were selected as the main demographic for this study.

As one of the most recently formed and most digitally connected generations, Generation Z consumers are an important demographic to consider for this research. They are distinguished by traits such as their reliance on technology, environmental consciousness, and desire for personalized products. Understanding this demographic is becoming increasingly crucial for marketers, as they represent the future of the consumer market. Therefore, the country of origin of household appliances can influence the decision-making process of Generation Z consumers in Kazakhstan.

With the literature observed, most researchers analysed the correlation between COO and product evaluation. Therefore, this study aims to investigate the relationship between Country of Origin (COO) and product evaluation of household appliances among Generation Z consumers in Kazakhstan. By analysing the preferences and attitudes of Generation Z consumers toward home appliances and the COO effect, this study will offer valuable insights into the generation's purchasing behavior. Home appliances are used often across the world's houses and are an essential component of customers' way of life. They make routine chores around the house, such as making dinner, maintaining the house, and doing the laundry, simpler and more effective to do. Moreover, Technodom, Mechta.kz, Alser.kz, and Evrika are among the top 50 private firms in Kazakhstan, according to Forbes Kazakhstan (2022). This indicates that the home appliance market in Kazakhstan has been seeing tremendous development over the last several years.

The study has a number of applications for the industry and other individuals who can benefit from it. First, retailers and manufacturers in the home appliance industry can gain from this

investigation. Therefore, these individuals can use this information to create marketing plans that are effective in appealing to the needs and preferences of Kazakhstan's digital natives. By gaining a better understanding of the COO effect, they can adapt their branding and product positioning strategies to suit the needs of this key demographic. Second, the analysis can serve as a valuable resource for additional studies on the effect of COO on Kazakhstani younger consumers' purchasing behavior. Moreover, the results of this investigation might offer a structure for further research on the impact of place of origin on other product categories and consumer demographics by analysing the relationship between country of origin and product evaluation of home appliances. This research will provide them with important insights into the preferences and attitudes of Generation Z consumers regarding household appliances and the country-of-origin effect.

1.1. Research Question

This study points to the following research question: What is the relationship between the country of origin and Generation Z's evaluation of household appliances in Kazakhstan?

1.2. Research Objectives

This research will contribute to the understanding of the COO effect on consumer behavior among Generation Z in the home appliance industry by achieving these objectives:

1. To investigate the relationship between COO and product evaluation of home appliance products among Kazakhstani consumers of Generation Z.
2. To assess the significance of COO for Generation Z consumers in Kazakhstan.

2. Literature Review

2.1 Country-of-Origin Effect

Han (1989) studied that the connection between a country and its goods is based on a halo effect, which indicates that consumers employ regional image in product evaluation. Therefore, when individuals have positive feelings about a country, they are more likely to positively evaluate its products and brands (White, 2012). However, according to Wegapitiya and Dissanayake's (2018) research, attitudes toward a country can

alter over time depending on a variety of reasons. For instance, Japan had a low image quality in the 1950s and 1960s among U.S. customers but significantly improved it in the 1980s and later. Furthermore, Wegapitiya and Dissanayake's (2018) cited various research papers that found a favourable association between a product rating and the economic status of the source country. There are a few other influencing factors that include the culture, history, and political orientation of the country which increase the appeal of employing the COO image on a worldwide scale (Hamzaoui-Essoussi, 2010). For instance, Chinese customers' propensity to buy Japanese items is influenced by the two nation's economic and military rivalry (Klein et al.,1998). Some Chinese customers consider purchasing Japanese items to be treasonous. Additionally, as a result of the Japan-South Korea trade dispute, the wave of boycotts began in South Korea in 2019. Supporters in the campaign avoided purchasing Japanese goods and services, traveling to Japan, and seeing Japanese films (Park & Ryall, 2019).

Researchers have been intensively examining the impact of the Country-of-Origin effect since the 1960s in the field of international marketing. The majority concentrated on verifying the Country-of-Origin Effect's existence. They have demonstrated that customers' beliefs and attitudes regarding nations tend to impact the judgment of goods from those countries (Sharma, 2011). As a result, the COO's effect on the goods or services was considered a significant piece of data in the decision-making process. However, with the globalization of markets, the enthusiasm for investigating the Country-of-Origin effect began to decrease in the late 1980s. Iacob (2016) discussed that globalization has consequently resulted in the idea that COO effects are no longer present. The premise was that customers have grown accustomed to engaging with items from many nations. Furthermore, buyers were uninterested in or were unaware of many products' actual places of origin. This realization led to the conclusion that COO effects are no longer a serious concern in international marketing. Nevertheless, Baker and Currie (1993) claimed that the Country-of-Origin effect, along with the Product, Price, Place, and Promotion, should be considered a fifth element of the Marketing Mix. Therefore, the question of how much effect the country-of-origin cue has on product assessments has yet to

be resolved, the opinions appear to range greatly.

2.2 Product Evaluation

A substantial amount of empirical research has emphasized the impacts of COO on product evaluation (Zbib, Ghaddar, Samarji & Wahbi, 2020; Sobolev & Nelson, 2019; Dursun et al., 2019). These studies stated that product assessment is directly connected with the COO effect as it influences the preference for goods of customers. According to Cateora (et al., 2019), and Bandyopadhyay and Banerjee (2002), it was established that consumers are more likely to purchase goods from specific countries than the same goods from other countries. It demonstrates the relationship between the decision-making process and the perception of various nations. Additionally, that study illustrates the connection between a nation's reputation and its significance to potential clients.

As claimed by Ali and Kaynak (2010) consumer opinions of industrialized countries are more positive than those of less industrialized nations. For instance, it appears when choosing home appliance products from Japan or China. People tend to think that products from Japan have better quality, design, and life cycle, even if it is not affordable for everyone. Furthermore, there were additional studies on the topic of product evaluation that depicts the attitude of economically advanced nations toward the decision-making process. Okechuku and Onyemah (1999) found that the bulk of these customers frequently choose domestically produced goods first, then those from other developed nations, and lastly those from less developed nations. Customers favoured Japan (38.4%) as the country of origin for major appliances above Germany (23.3%), the United States (20.9%), and France (15.1%), according to the research. Additionally, there are conflicting data regarding the relationship between COO and product evaluation. In accordance with the prevalence of the papers, the country-of-origin effect has a favourable impact on product category evaluation rather than brand assessment, and the COO effect is more beneficial for goods originating in more developed states than those originating in less developed ones.

Consumer ethnocentrism may lead to the amplification of specific qualities and characteristics of native items and the undervaluation of these qualities in foreign goods, as demonstrated by Sharma et al. (1995) and Rawwas and Rajendran (1996). Customers from industrialized nations, according to Wang and Chen (2004), are more likely to evaluate locally produced goods favourably than imported goods, whereas, in emerging markets, consumers evaluate both intrinsic and extrinsic cues to determine that imported goods are superior to locally produced goods. Consequently, it can be said that certain associations between COO and product might exist. Despite their objectiveness and truthfulness, the perception of products from various countries by consumers and product country images related to them may have a significant role in the decision-making process. These perceptions and narratives operate more with the abstract and emotional aspect, rather than with the actual aspect of COO and product evaluation.

2.3 Demographics

Several researchers have looked into the COO effect among Generation Z from various demographic perspectives. For example, Giraldi and Ikeda' (2009) study about the relationship between age and COO has shown that young consumers have become more open and receptive to foreign products. However, Schooler (1971) and TQngberg (1972) found that older people rate foreign goods more highly than young people. It is important to note that Wang (1978) did not find such an effect. In addition, Schaefer (2010) exposed that the country of origin has a more pronounced impact on elderly customers, possibly because they rely more heavily on general mental categories.

The findings of the study by Nagy (2017) demonstrated that most individuals from the late Generation Y and early Generation Z purchased their mobile phones from well-established and reputable brands. Based on the research findings, it can be concluded that the nation in which mobile phones are manufactured has a significant effect on the buying preferences of Generations Y and Z, considering factors such as technical specifications, pricing, aesthetics, brand reputation, operating system, and storage capability. Insch and McBride (2004) considered age to be a determining factor. The results show that

younger consumers in Mexico value the country of origin (COO) of a product more than older consumers. The effect of age observed in this study may reflect the historical context of Mexico's consumption patterns, moving from formal import substitution policies and closed economies to trade liberalization and greater exposure to imported products. There is a marked shift to this may be because younger Mexicans grew up in a more open and globalized economy with higher volumes of imports from different countries. Older generations experienced a time when Mexico pursued protectionist policies and restricted legal imports, but this may have influenced their view of their COO. Studies by Schooler (1971), Dornoff (1974), and Wang (1978) have shown that more educated people tend to appreciate a foreign product more highly and pay more attention to COO when buying goods than people with a lower level of education. Giraldi and Ikeda (2009) investigated that education can have an impact on the initial effect of the country. Nevertheless, Tonberg's (1972) research did not discover a connection between the level of education and COO. The research on the COO effect's influence on purchasing behavior among different sexes has been conflicting. According to certain studies, women are more influenced by the COO effect than men. For example, Bhardwaj and Fairhurst (2010) discovered that women were more likely to be influenced by the COO effect when purchasing apparel. Furthermore, Mamula and Paunovic (2022) discovered that younger women were the least ecologically conscientious group among Generation X and Generation Z groups. The research on the COO effect's influence on purchasing behavior among different sexes has been conflicting. According to certain studies, women are more influenced by the COO effect than men. For example, Bhardwaj and Fairhurst (2010) discovered that women were more likely to be influenced by the COO effect when purchasing apparel. Furthermore, Mamula and Paunovic (2022) discovered that younger women were the least ecologically conscientious group among Generation X and Generation Z groups. Mamula and Paunovic conducted research on Generation Z students, namely primary, secondary, and university students in the Republic of Serbia and Respublika Srpska. The number of people was 1338 students. This study found no statistically significant difference between males and females in COO exposure.

In summary, it is hypothesized that individuals belonging to Generation Z are influenced by the COO effect when assessing products. Consequently, the impact of the country of origin might be linked to the age of the consumer. Additionally, previous studies have yielded mixed results on the influence of the nation of production on consumer behavior across genders. Some studies indicate that women are more susceptible to the COO effect, while others find no significant difference between genders. Future research may explore the impact of other demographic factors such as age, location, income, and education on the COO effect among Generation Z consumers. The literature review underscores the importance of understanding how the country of origin affects the decision-making process of Generation Z customers, particularly in the realm of home appliances. Prior investigations have indicated that consumers exhibit a tendency to favour products originating from specific nations, owing to the perceived reputation of these countries for delivering exceptional quality, innovative features, and reliable performance. As a result, the geographical origin of a product holds the potential to shape how consumers perceive and assess its merits, impacting their choices when making a purchase. Therefore, the research study can offer important insights into the preferences and attitudes of Generation Z customers regarding home appliances and the country-of-origin effect by building on the current literature.

3. Variables and Model

The study model was drawn from the literature analysis previously discussed, which suggested that customers may assess products using both intrinsic and extrinsic signals (Figure 1). Olson and Jacobi (1972) determined that consumers use both internal (performance, design, flavour, fit, quality) and external (brand image, store, advertising, price, warranty) characteristics to evaluate a product, where the COO is viewed as an external indicator that may impact the assessment. Therefore, this research utilized country-of-origin and product evaluation as the variables, including design and quality as the internal and price as external components. For a more in-depth analysis,

the consumer's income, education, and place of residence were added to the questionnaire based on the demographic parameters.

Figure 1

Research Model

Country-of-Origin
↓
Product Evaluation Design Quality Price
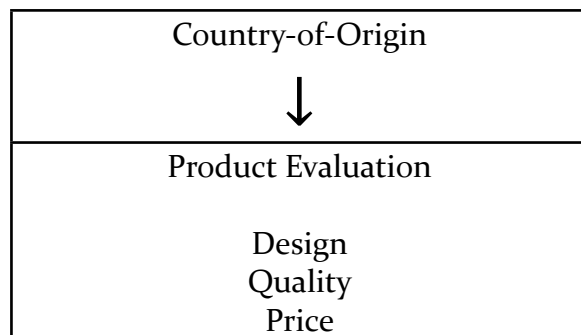
3.1. Research Methodology

A mix of quantitative and qualitative research approaches was chosen for this study. Two methods allowed the study to assess the significance of the COO and to investigate the relationship between the COO and product evaluation corresponding to the research objectives.

3.2. Quantitative Methodology

The purpose was to collect 100-150 answers from Generation Z with different backgrounds in order to define the correlations between the country-of-origin effect and product evaluation. Moreover, a non-experimental method was taken for this research due to the samples not being created from scratch. In addition, this approach contributes to the preservation of objectivity in the study, which will give more accurate results.

To convey the link between Country of Origin and Product Evaluation, the structured close-ended questionnaire was separated into two sections that included closed-ended multiple-choice and 5-point Likert-scale relationship-based items. The first part of the system was designed to gather demographic information such as age, gender, location, income, and level of education. A variety of question types were included in the questionnaire's second portion. They focused on respondents' impressions of the country's image as well as the significance of country-of-origin (COO) in product evaluation (Yang, Ramsaran & Wibowo, 2017). The next set looked at how individual product qualities including COO, price, brand name, social popularity, promotional offers, and quality can have a moderating influence (Zbiba, Ghaddara, Samarjib & Wahbic, 2021) in which internal and external signals served as the basis for evaluating the items (Dursuna, Kabadayib, Ceylanc & Koksald, 2019). The countries included Russia, China, South Korea, Turkey, Uzbekistan, Germany, Italy, the United Kingdom, and Sweden as the main HAs importers to Kazakhstan (Taybekuly, 2020). The Likert scale was chosen as the major data-collecting method because it provides a straightforward and standardized manner of evaluating attitudes and perceptions, allowing for quantitative data analysis. When compared to a binary response style, the adoption of a 5-point scale provided better sensitivity in determining the degree of agreement or disagreement with the claims.

In order to explore the relationship between COO and Product Evaluation, a combination of Spearman's rho correlation was employed to evaluate the associations between the variables. These approaches' insights enabled proper conclusions to be formed on the study topics. First, correlation coefficients were generated specifically to analyse the strength of the links between variables, allowing the discovery of positive or negative correlations and the degree to which they were connected. Furthermore, percentage analysis was used to examine the distribution of the survey answers. The proportion of participants who replied to a specific way to a given question was determined using this method. This aided in identifying patterns or trends in the data and enabled the development of relevant conclusions.

3.3. Qualitative Methodology

To provide a concentrated but flexible study of the link between the COO and the product assessment cues, semi-structured and structured interviews were utilized among the consumer and HA retail shop assistant respondents with Russian used as the main communication language. Baker and Edwards (2012) suggested recruiting at least a dozen interviewees to provide an appropriate sample. Thus, the method was divided into two stages with the purpose to interview 12 consumer respondents and 12 shop assistants. Conducting an interview among the retail members provided valuable insights into consumers' decision-making processes in the HA industry. As a result, finding

consistency, deviations, and apparent biases in the data may be aided by contrasting the views of HA shop sellers and customer participants. Additionally, key questions from Yang, Ramaran, and Wibowo's (2017) study were modified to focus on the importance of the country-of-origin and HA product evaluation criteria during the decision-making process. Before the interviews began, all participants gave permission, and the required ethical considerations were addressed. For the aim of doing further content analysis, all of the recorded interviews were transcribed.

4. Data Collection

This study's quantitative data collection took place in April 2023. The convenience and snowball samples consisted of Kazakhstani Generation Z citizens, where 175 respondents participated through recruiting on social media platforms, such as WhatsApp, Telegram, and Instagram. Furthermore, participation was confidential and voluntary to save respondents' data, and the survey instrument was pilot tested with ten undergraduate students to ensure its intelligibility and readability. The final questionnaire contained 14 items as a result. When the data were analysed, 52% of respondents were male and 48% were female (Table 1). Individuals were from Astana (53,1%), Ust'- Kamenogorsk (21,7%), and Almaty (17,7%) cities. The remaining part of respondents was from Karaganda (2,3%), and Shymkent (1,1%) and the percentage of other localities was 4.2%. Moreover, the survey included a question on education to research the correlation of the COO effect with the level of education. The majority of the respondents have a bachelor's degree (42,9%) and higher incomplete education (33,1%). In addition, other individuals have master's degrees (9,7%) and specialized secondary education (14,3%). Furthermore, most of the respondents have income between 151K and 300K (34,9%), others earn between 301K and 450K (19,4%) and there's a percentage of those whose income level is below 150K. Correspondingly, the remaining individuals' income level is between 451K and 600K (6,3%), above 601K (8%), and those who do not have income (13,7%).

Table 1

Socio-demographic profile of the participants		
Characteristic	Frequency	Percentage
Place of residence		
Almaty	31	17.7%
Astana	93	53.1%
Shymkent	2	1.1%
Karaganda	4	2.3%
Pavlodar	1	.6%
Semey	1	.6%
Ust'-Kamenogorsk	38	21.7%
Kyzylorda	1	.6%
Kostanay	1	.6%
Aktau	1	.6%
Kokshetau	1	.6%
Rural areas of Kazakhstan	1	.6%
Gender		
Female	91	52%
Male	84	48%
Levels of education		
Secondary special education	25	14.3%
Incomplete higher education	58	33.1%

Bachelor's degree	75	42.9%
Master's degree	17	9.7%
Income levels		
Not earning yet	24	13.7%
Less than 150,000 tenge	31	17.7%
From 151,000 to 300,000 tenge	61	34.9%
From 301,000 to 450,000 tenge	34	19.4%
From 451,000 to 600,000 tenge	11	6.3%
Over 601,000 tenge	14	8%

The two-stage exploratory study was conducted among 13 customer respondents and 12 store employees employing qualitative research methodology in April and May 2023. They were recruited through the convenience and snowball sampling procedure participating via face-to-face, audio, and video call communication. The consumer respondents included 38% of females and 62% of males with an average age of 25 (range = 21-30). Participants had different geographical and demographic backgrounds however the majority of them were from big cities such as Astana and Almaty, remaining were from Ust-Kamenogorsk, Shchuchinsk, and rural areas of the North-Kazakhstan region. During the second stage, shop assistants had the qualifying requirement to have at least six months of experience in the store and were questioned during lunch breaks or on days off in Astana (Technodom, Sulpak, Mechta. kz). To preserve their privacy and interests, interview subjects are made anonymous.

5. Quantitative Findings and Analysis
JASP Statistics was used as the data analysis tool, and Spearman's rho correlation was employed to determine the link between variables. Thus, the results indicated that the significance of COO in the purchase of home appliances was perceived by the participants as neutral (mean score = 3.5) but almost half (53.2 %) believed or strongly believed that the country is important when buying home appliances, while 25.1% were neutral and 21.7% disagreed or strongly disagreed on this statement. As a result, there was no correlation based on gender, education, and income levels and COO importance. However, the findings (Table 2) showed a negative correlation between habitat and COO, indicating that when the density of the site decreases (i.e., in sparsely populated or rural areas); the COO decreases in importance. Then when respondents were asked to rate the significance of the country of origin along with internal and external cues such as price, quality, design, discounts and bonuses, warranty availability, and stores the average value was 3.2 out of 5. There are negative correlations in gender and location variables with the COO. This means that as the gender of the survey respondents shifted from female to male then their opinions of the COO turned less favourable and for respondents who live in less populated areas, the COO is less significant for those who live in more inhabited ones.

Table 2

Spearman 's Rho Correlation (The Questionnaire Data)			
			Spearman
		r	p
Location	The importance of COO when purchasing HA	−.153*	.043
Location	The importance of COO when purchasing HA (along with the intrinsic and extrinsic cues)	−.238**	.002
Gender	Importance of COO when purchasing HA	−.029	.701
Gender	The importance of COO when purchasing HA (along with the intrinsic and extrinsic cues)	−.158*	.036
* p < .05, ** p < .01, *** p < .001			

When respondents have been asked about the refusal of goods primarily based on the states of production, almost one-half (50.3%) answered that they had not declined, and another part (49.7%) responded that they have refused to purchase. Additionally, the answers indicated that the majority (66.8%) either agreed or strongly agreed that they could pay extra for home appliances made in a country well-known for producing the highest quality goods, while 11% disagreed or absolutely disagreed and 19.4% neither concurred nor disagreed. Spearman's Rho assessment revealed the following relationships between the variables where both the likelihood of goods rejection formulated on the COO and the willingness of spending more for products from a country known for the superior quality of goods were positively correlated with the significance of the COO for the individuals (Table 3). It further indicates that individuals who viewed the place of origin as an essential factor in their purchasing decisions were additionally more likely to refuse to purchase products based on their country of origin and more willing to pay a premium for products from countries associated with the high-quality.

Table 3

Spearman 's Rho Correlation (The Questionnaire Data)			
			Spearman
		r	p
Importance of COO when purchasing HA	Refusal to purchase HAs due to its COO	.390***	< .001
	Willingness to pay more for goods from a country associated with high quality	.315***	< .001
	Importance of affordable prices	−.148	.051
	Importance of design	.164*	.030
	Importance of quality	.120	.113
	Importance of discounts and bonuses	.052	.493
	Importance of store	.305***	< .001
* p < .05, ** p < .01, *** p < .001			

This study discovered a favourable relationship between the significance of the store and COO (r = 0.305, p < 0.001), which means that customers who position a great deal of importance on the country of origin are also more likely to place a high valuation on the store in which the product is purchased.

Further, individuals were given a list of states and instructed to select the ones they associated with budget home appliances. Notably, 85.7% of participants selected China (Table 4). This country was followed by Russia (52%), Uzbekistan (50%), Turkey (34.9%), South Korea (12%), Germany (6.7%), Sweden (4.6%), Italy (4%), and the United Kingdom (3.9%). Additionally, some of the participants highlighted more than one option, demonstrating that they may associate low-cost home appliances with multiple countries.

Table 4

Country associations with low-cost HAs		
Country	Frequency	Percentage
Russia	91	52%
China	150	85.7%
South Korea	21	12%
Turkey	61	34.9%
Uzbekistan	88	50.3%
Germany	12	6.9%
Italy	7	4%
United Kingdom	6	3.4%
Sweden	8	4.6%

In terms of high-quality domestic appliances in Table 5, Germany was selected the most often (89.7%), followed by South Korea (62.3%), Sweden (53.1%), Italy (42.3%), the United Kingdom (42.3%), China (12.6%), Russia (10.9%), Turkey (10.3%), and Uzbekistan (1.1%). These findings suggest that participants evaluate German-made HAs to be of high quality.

Table 5

Country associations with high-quality HAs		
Country	Frequency	Percentage
Russia	19	10.9%
China	22	12.6%
South Korea	109	62.3%
Turkey	18	10.3%
Uzbekistan	2	1.1%
Germany	157	89.7%
Italy	74	42.3%
United Kingdom	74	42.3%
Sweden	93	53.1%

Regarding innovative design, respondents associated this cue with a variety of nations. From Table 6, the findings demonstrated that the most frequently chosen country was South Korea (74.9%). Further, the results were ordered by Germany (45.7%), Italy (33.7%), China (30.3%), Sweden (29.7%), the United Kingdom (25.7%), Turkey (3.4%), Russia (1.7%), and Uzbekistan (1.7%).

Table 6

Country associations with an innovative and modern design of HAs		
Country	Frequency	Percentage
Russia	3	1.7%
China	53	30.3%
South Korea	131	74.9%
Turkey	6	3.4%
Uzbekistan	3	1.7%
Germany	80	45.7%
Italy	59	33.7%
United Kingdom	45	25.7%
Sweden	52	29.7%

These results indicate that participants might consider South Korean-made HAs to have an innovative design, German-made HAs to be of high quality, and Chinese-made HAs to be budget-friendly. However, there is a negative correlation between the significance of the COO and the likelihood of associating China with inexpensive household appliances ($r = -0.153$, $p = 0.043$), indicating that as the meaning of the COO increases, the probability of associating China with affordable household products decreases. This may suggest that respondents who place a higher value on the COO are less likely to regard China as a source of low-cost goods. In addition, the study discovered an unfavourable relationship between the rate of rejection to purchase appliance items because of their country of origin and China's association with high-quality home appliances ($r = -0.195$, $p < 0.01$). This indicates that consumers may have a negative perception of China as a high-quality appliance manufacturer, resulting in a reluctance to purchase Chinese-made appliances. Moreover, there is a negative relationship between the level of unwillingness to buy products and China's association with modern appliance design ($r = -0.233$, $p < .01$). This suggests that consumers may not perceive China as a source of contemporary, innovative household appliance designs.

Findings from an in-depth interview with the shop assistants

Key Constructs	Interview Questions	Findings	Quotes from Interviews
Importance of COO	Is country of origin an important reference for customers aged 18-30 when choosing home appliances?	7 out of 12 (58%) of informants agreed that the COO plays an important role in choosing home appliances among Generation Z consumers. The remaining half of the informants warn that for the generation Behind COO is not the main criterion when choosing home appliances.	'Many buyers are not impressed by the country of origin of China, Vietnam, and Bangladesh with its quality.' (Informant 1)

'For buyers, it is constantly a question of "What is the assembly of this product" and mostly it is asked over 30. That is, who knows little about technology. But from 18 to 30, they know that in principle they do not have so much influence. The main thing is that this product is not made in China, there, assembly, or Vietnam.'(informant 3)

'In this category of customers, the country of production does not particularly affect, since the generation is already more intelligently approaching the purchase of goods.'(informant 10) |
| HA products evaluation criteria | What is important for customers aged 18-30 when buying home appliances besides the country-of-origin? | Generation Z consumers pay attention to the characteristics, functionality, advantages, quality, and service life when choosing HA products. | 'Product characteristics, product quality and service life.'(informant 1)

'The functionality is for the younger generation - from 18 to 30. But over 30 is all. The main thing for them is that it works and there is no assembly of China, that is all.'(informant 3)

'Functionality, practicality and design are important.'(informant 12) |
| Country Image | Are there any specific countries that are more popular among customers 18-30 years old in Kazakhstan? | 10 out of 12 (82%) of informants said that European-made HA products, in particular, Germany, are popular among Generation Z consumers in Kazakhstan. It was also revealed that Korean-made products are in great demand. Russian-made HA products are also quite popular. | 'Korean equipment is famous of course, but Chinese is also gaining popularity.'(informant 2)

'The most popular assembly was Russia and the country that produces this product. In principle, everything, these are the only countries that were popular when choosing a product, if, say, when choosing a TV, they are used to Samsung there, they are guided either by the assembly, how popular is Russia and Korea itself.'(informant 3)

'InKazakhstan,thisisGermany.'(informant4)

'Italy, Germany, France, Sweden.'(informant 12) |

Country Image	Do you remember any examples of when customers 18-30 years old avoided home appliance products because of the country-of-origin?	Consumers are positive about the HA product produced in Germany and Korea. And ready to overpay for this quality. 50% of informants confirm that consumers have a negative attitude to the HA product produced in China. It was also found that among the younger generation can be positive. to speak about a product manufactured in Russia, starting from the build quality.	'Recently, I sold a frying pan to WMF and there were two similar frying pans, one German-made, the other Chinese, the German one was more expensive by 20,000 tenge and the customer took the German assembly, since the German assembly is better.'(informant 1) 'Yes, there have been cases often avoid China's products.'(informant 2) 'I remember an elderly couple was looking for a refrigerator for themselves, I approached them, asked questions on all criteria, what kind of goods they needed. And I offered them one refrigerator, but it had a China assembly. Despite the fact that the product met all the criteria they listed, they did not like the product I offered, because there was a China assembly.'(informant 3) 'A young couple came up to me and started looking for a TV. They wanted a TV assembly Korea from Samsung. I explained to them that we do not yet have such a product with such production, only Russia. I explained to them the advantages and why the Russian assembly is in no way inferior to Korea and was pleased with the nice conversation. They agreed to these conditions and the sale was successful.'(informant 3) 'The negative reaction was caused by the country-of-origin Uzbekistan.'(informant 7)
Demographic Differences	Have you noticed any differences in buying behavior between younger and older customers when choosing home appliances?	The 100% result showed that the younger generation is more advanced, and for them the country of origin does not play a key role. The older generation is more susceptible to COO.	'Young buyers are usually more advanced in terms of technology and understand it, and the older ones need to explain the difference'(informant 1) 'Older generations are more capricious than the young ones.'(informant 3) 'Yes, there is some difference, because the younger generation looks at the features, functions. They pay less attention to the country of origin. And the older generation pays more attention to the country of origin.'(informant 4) 'Young people look more at design, and adults are interested in quality.'(informant 9)

Demographic Differences	Do you think there are any specific home appliance products that are more popular among groups of 18-30 years in Kazakhstan?	The younger generation most often buy smartphones, laptops, and smart home products.	'These are mainly smartphones and accessories for them.'(informant 1) 'There is the most popular product is a cell phone and a smart home system.'(informant 2) 'People who are from 18 to 25, up to 23 often take phones. We have statistics in CRM when selling, if we compare from 25 to 40, here they take home appliances.'(informant 3)
Demographic Differences	How do you think the influence of country of origin varies across different generations of customers?	Half of the informants replied that there was no difference in the choice of a HA product based on it among people of different ages. The other side of the informants replied that the younger generation is less susceptible to COO.	'Older people pay more attention to the country of origin.'(informant 1) 'In principle, it does not affect so much, it affects a person. That is, everyone chooses in their own way, well, in principle, I did not notice such a difference [between generations].'(informant 2)
Demographic Differences	Have you noticed a difference in the perception of the COO among 18-30-year-old women and men?	75% of informants confirm that there is a noticeable difference in the perception of the country of origin among women / men. It was found that women pay more attention to the country of production, and men mostly pay attention to the function, characteristics, and other criteria of the HA product.	'Noticeable, men usually don't care, the main thing is that it works, and women carefully select the goods for 2-3 hours.'(informant 1) 'Noticeable because men approach the choice of the product in more detail than women.'(informant 2) 'There is a difference between the choice of women and men. When a woman chooses household appliances, she focuses on the brand and the country of production. But men are also on the brand, but mostly they are interested in the function."(informant 3)

5.1. Qualitative Findings and Analysis

The results of the interview showed that for Generation Z, when choosing a HA product, the country of origin is not the key criterion. They pay attention to the characteristics, function, service, and quality. On the contrary, the adult generation is more susceptible to this. Among the consumers of Generation Z in Kazakhstan, HA products made in Germany and Korea are in demand. In addition, consumers are ready to buy a HA product manufactured in Russia for a high-quality assembly. On the contrary, consumers mostly speak negatively about China's products. It was found that women pay more attention to the country of origin. On the contrary, for men, the country is not the key criterion.

Findings from an in-depth interview with the shop assistants

Key Constructs	Interview Questions	Findings	Quotes from Interviews
COO Importance	Do you consider the country of origin as an important factor when choosing home appliances?	The following were the most often provided responses by informants: it matters (6/13 or 50%), does not matter (3/13 or 25%), and brand matters (2/13 or 15%).	'Nowadays the brand's reputation and the market's recommendations regarding different products are important.' 'I believe that Japanese technology is the most reliable and advanced' 'I look for the production to be European, either Taiwan or factory China.'
Influence of other features	Besides the country of origin, which factors do you consider necessary when choosing home appliances?	The majority of the respondents value quality (50%), others look for brand image and price (35%), remaining to assess the warranty (15%) and design (10%).	'Price-performance ratio is important 'Materials from which the equipment is made matter. At the same time, I look at the design to combine the interior of the house.'
Country Image	Which countries do you prefer when choosing home appliances?	The top countries were Germany, Japan, and South Korea.	'Even as a child, I had the idea that in Germany the quality is at the highest level.' 'In Taiwan, relatively low prices for goods, and their performance is good.'
Country Image	Which countries do you associate with affordable, high-quality, and innovative design home appliances?	8 out of 13 informants chose China and Russia as the countries with affordable HA. 6 out of 13 respondents defined European countries as the producer of high-quality HA. 7 out of 13 informants characterized South Korea as a country with modern design.	'The choice of China as a country with low-end appliances is associated with high production in the country and with prejudices regarding the production of imitations of various brands.' 'Asian brands are more focused on functionality and practicality.'

COO Effect	Can you remember cases when you refused to buy home appliances because of the country in which they were produced?	Overall, 5 out of 13 of the respondents faced a situation when they had to return goods from China and Belarus due to their being broken or having low quality. Most of the respondents (65%) perceived China and CIS countries in a negative way. As well as European countries in a positive way (25%).	'Everything that is done in general in the CIS there is no particular conviction in the quality. Moreover, they always have outdated designs.' 'Currently, I am pleased with the market of Uzbekistan. They also began to produce equipment.'
Purchase Intention	Would you pay more for the HA goods made in the country known for its high-quality products?	11 out of 13 informants do not mind overpaying for qualitative HA.	'I am ready to overpay 20% for products from Germany.' 'The needs will grow with age, so I'm ready to overpay for a product with high quality.'

This data is based on the research of the results of the in-depth interview with consumers completed by 13 respondents in the Gen Z group study. Following a thorough review of the results, it was discovered that there was no difference between the scores achieved by males and females, who received 50% and 50%, respectively. Every survey respondent had a unique background and line of employment, including developers, attorneys, students, business owners, stay-at-home parents, and unemployed individuals. This interview's analysis was carried out using the percentage technique to establish the relative frequency of patterns, trends, and correlations between the variables.

It has been determined to compare both the customer and counsellor interviews using qualitative content analysis. The majority of retail shop advisors agreed that COO is important while purchasing HAs and that Generation Z customers avoid assembly made in Vietnam, China, and Bangladesh. Contrarily, 7 out of 13 (53.8%) consumer respondents stated that the COO is not relevant since they place more importance on the brand's reputation and image. It can therefore be claimed that it varies for each Generation Z consumer.

Moreover, counsellors from stores who responded to the inquiry on additional desirable qualities of potential HA products highlighted that customers prioritize warranty, acceptable quality, design, and pricing.

Additionally, the counsellors' and Generation Z consumers' perspectives on this one is similar. Almost every participant from the first group mentioned nations like Germany, Italy, France, and Sweden when defining the best countries to purchase HAs from. Generation Z consumers, on the other hand, share their viewpoint because they choose HAs from European countries as well.

Additionally, according to the store advisors, there have been instances where customers have declined to purchase HA because of COO and because the products came from China and CIS countries including Russia, Kazakhstan, and Uzbekistan. On the other hand, 7 out of 13 (53.8%) respondents from the second group haven't faced such situations. However, the remaining part coincides with the unsatisfactory quality of HA in those countries.

For consumers, the brand and manufacturing country are crucial factors. Consumers who believe that the country of origin is a guarantee of good quality are willing to pay more for it in eight out of 13 (61.5%) cases. Additionally, according to 7 out of 12 (58.3%) assistants, Generation Z customers have a high purchase intention when it is about high-quality HAs.

Overall, Generation Z customers have both positive and unfavourable opinions on the HAs from particular countries based on their social, demographic backgrounds and personal experiences which could lead to the link between the COO and product evaluation cues.

6. Conclusion

This research aimed to examine the country-of-origin effect among Generation Z consumers in Kazakhstan and product evaluation of home appliance products. Through a comprehensive review of the literature, collection of data from a representative sample of Generation Z consumers as appliance store and consumer consultants, and analysis of the data, several conclusions were drawn.

Firstly, it was evident that the country of origin has a relationship with the Generation Z consumers' good assessments. The research revealed that customers have varying degrees of preferences for products originating from specific countries. Factors such as perceived product quality, price and design might play a crucial role in shaping these preferences. Additionally, the "Made in" country might lead to overpaying for the goods if the nation is associated with high-quality products. Therefore, this finding highlights the need for companies to effectively communicate the origin of their products to this consumer segment and align it with their preferences and values.

Secondly, it has been noticed that purchasing behavior and attitude toward COO differ from gender to gender. Moreover, counsellors claim that the majority of females are influenced by the COO Effect. Men pay attention to the function, qualities, and other factors of the HA product, whilst women tend to focus more on the country of origin. A statistic in Table 2 further supports the idea that different opinions on COO exist.

Thirdly, the COO effect may have stronger relationships in more populated areas. The results show a greater association between the significance of COO in an urban environment. Therefore, the stakeholders may be able to better adjust their plans to match the needs of Kazakhstani customers and take advantage of market possibilities if they are aware of the country-of-origin trend in these regions. The findings of this study also imply that more research on COO aspects is needed. This is particularly intriguing since there is a lack of COO investigations in the Central Asian region, where this area of marketing research is still emerging which should be also considered in future research.

7. Limitations

Although discoveries were made, it is important to be aware of the study's limitations. These restrictions might serve as recommendations for further study. First, to examine the association between COO and Product Evaluation among Generation Z customers in Kazakhstan, the investigation employed judgemental convenience and snowball samples where the primary issues are randomness and bias, neither of which can be monitored or controlled. Second, results were restricted to individuals who spoke the Russian language. Thus, consumers who speak Kazakh as their first language were not taken into account. Consequently, to further understand the evaluation's findings among the Kazakh-speaking respondents, more studies will be required. Third, the questionnaire and interview questions were adapted from English to Russian language. This could result in distortion of the intended message or misinterpretation and impact respondents' responses, resulting in skewed data and biased conclusions. Fourth, lack of a cause-effect relationship between the variables. This limitation could not establish which variable is instigating the changes in the other. Although correlation analysis might indicate a statistical relationship between the factors, it cannot show that the connection is causal. Therefore, further research is required to demonstrate such links between variables. Finally, a product may be a hybrid of many distinct nations' items in the increasingly intertwined world of global commerce. For instance, a vacuum cleaner that was created in China and manufactured in Russia may have various origins with the distinctive country of the brand or the place of assembly. This implies that the COO phenomenon may be far more intricate than the designs used in the majority of investigations. Therefore, to provide comprehensive implications, future studies should take this into account.

8. Recommendations

Based on these findings, several recommendations can be made for marketers, businesses, and policymakers. Firstly, companies should invest in transparent and informative communication strategies to highlight the country of origin and its positive attributes to Generation Z consumers. Building a strong brand image and leveraging cultural associations can be effective in capturing the attention and loyalty of this consumer segment. Additionally, companies should consider conducting market

research to identify the specific preferences and perceptions of Generation Z consumers in Kazakhstan regarding different countries and product categories. This will help tailor marketing strategies and product offerings to better align with their expectations and desires. Also, companies should pay attention to the place of production itself, to countries that are associated with well-known quality, since people are willing to pay more for such equipment, in addition, design is also an important criterion. Moreover, policymakers can support companies by providing regulations and incentives that promote ethical and sustainable practices, as Generation Z consumers in Kazakhstan have demonstrated a growing interest in these aspects. Aligning product origin with sustainability and social responsibility can enhance the appeal of products to this consumer segment.

9. References

1. Ayagan B. G.,(2019). After the collapse of the USSR: Kazakhstan and Russia on a new round of history (1991-2000). Journal of Scientific and Educational "History" 2019.

2. Baker, M. J., & Currie, C. A. (1993). Country of origin: the fifth element of the marketing mix. In Marketing Education Group Conference (pp. 149-167).

3. Baker, S. E., & Edwards, R. (2012). How many qualitative interviews is enough.

4. Bhardwaj, V. & Fairhurst, A. (2010). Fast fashion: response to changes in the fashion industry. The International Review of Retail, Distribution and Consumer Research, 20(1), 165-173.

5. Country-of-origin (COO) impact and product categories' evaluations: The case of an emerging market. (2020). Journal of Marketing Development and Competitiveness, 14(1). https://doi.org/10.33423/jmdc.v14i1.2770

6. Dursuna, I., Kabadayib, E. T., Ceylanc, K. E. & Koksald, C. G. (2019). Russian Consumers' Responses to Turkish Products: Exploring the Roles of Country Image, Consumer Ethnocentrism, and Animosity. Business and Economics Research Journal Vol. 10, No. 2, 2019, pp. 499-515 doi: 10.20409/berj.2019.182

7. Forbes Kazakhstan. (2022, December 19). 50 крупнейших частных компаний Казахстана - 2022. https://forbes.kz/leader/50_krupneyshih_chastnyih_kompaniy_-_dekabr_2022_1671418283/

8. Gary, S., McBrideb, J.B. (2002). The impact of country-of-origin cues on consumer perceptions of product quality: A binational test of the decomposed country-of-origin construct. Journal of Business Research 57 (2004) 256 – 265

9. Giraldi, Ikeda A.A., (2009). Personal values and the 'country-of-origin effect': the moderating role of consumers' demographics. University of São Paulo (USP), São Paulo, Brazil. International Journal of Consumer Studies ISSN 1470-6423.

10. Hamzaoui-Essoussi, L. (2010). Technological Complexity and Country-of-Origin Effects on Binational Product Evaluation: Investigation in an Emerging Market. Journal of Global Marketing, 23:306–320.

11. Han, C. M. (1989). Country image: halo or summary construct. Journal of marketing research, 26(2), 222-229.

12. Iacob, A. I. (2016). Country-of-Origin Effect on Brand Perception: A Systematic Review of the Literature between 1993 and 2013. Perspectives on International Business: Theories and Practice, 221-275.

13. Klein, J. G., Ettenson, R., & Morris, M. D. (1998). The Animosity Model of Foreign Product Purchase: An Empirical Test in the People's Republic of China. Journal of Marketing, 62(1), 89–100. https://doi.org/10.2307/1251805

14. Klinger, D. W., & Schuh, A. (2007). The country-of-origin effect: a matter of perceived differences and consumer affinity. Journal of Consumer Marketing, 45-67.

15. Mamula T. N., Paunovic I. (2022). Examining Generation Z's Attitudes, Behavior and Awareness Regarding Eco-Products: A Bayesian Approach to Confirmatory Factor Analysis. Journal of Sustainability.

16. Nagy, S. (2017). The Impact of Country of Origin In Mobile Phone Choice Of Generation Y And Z. Journal of Management and Training for Industries Vol.4, No.2 DOI: 10.12792/JMTI.4.2.16

17. Okechuku, C., & Onyemah, V. (1999). Nigerian Consumer Attitudes Toward Foreign and Domestic Products. Journal of International Business Studies, 30(3), 611–622. https://doi.org/10.1057/palgrave.jibs.8490086

18. Olson, J. C., & Jacoby, J. (1972). Cue utilization in the quality perception process. ACR Special Volumes. Özbay, F. (2011). The Relations between Turkey and

Russia in the 2000s. Perceptions, 16(3), 69.

19. Ostrovskiy, A., Garkavenko, V., & Rybina, L. (2019). Influence of socio-psychological factors on consumers purchasing behavior in Kazakhstan. The Service Industries Journal, 1–26. https://doi.org/10.1080/02642069.2019.1601707

20. Park, C. & Ryall, J. (2019, July 4). South Koreans call for a boycott of Japanese cars, beer, and cosmetics as the 'trade war' intensifies. This Week in Asia: Economics. https://www.scmp.com/week-asia/economics/article/3017263/south-koreans-call-boycott-japanese-cars-beer-and-cosmetics?module=perpetual_scroll_0&pgtype=article&campaign=3017263

21. Schaefer A., (1997). Do demographics have an impact on country of origin effects?. Journal of Marketing Management, 13:8, 813-834, DOI: 10.1080/0267257X.1997.9964513.

22. Schooler, Robert D., Wildt, Albert.R. (1968). Elasticity Of Product Bias. Journal of Marketing Research 5. 78-81.

23. Sharma, P. (2011). Country of origin effects in developed and emerging markets: Exploring the contrasting roles of materialism and value consciousness. Journal of International Business Studies, 42(2), 285–306. http://www.jstor.org/stable/25790119

24. Sobolev V., Nelson R., (2020). Made in My Village: Exploring Country of Origin Effects and Bi-National Products Across Cohorts in Ukraine. Journal of International Consumer Marketing 2020, VOL. 32, NO. 2, 94–114

25. Taybekuly. (2020, March 30). Рынок бытовой и электронной техники: гегемония России и наступление Узбекистана. Kapital.kz. https://kapital.kz/economic/85618/rynok-bytovoy-i-elektronnoy-tekhniki-gegemoniya-rossii-i-nastupleniye-uzbekistana.html

26. Tongberg, R. C., (1972). An Empirical Study of Relationships Between Dogmatism and Consumer Attitudes TowardForeign Products.' dissertation, The Pennsylvania State University.

27. Wang, Chih-Kang. (1978). The Effect of Foreign Economic, Political and Cultural Environment on Consumers' Willingness to Buy Foreign Products. Ph.D. dissertation, Texas A &MUniversity.

28. Warren J., Bilkey & Erik Nes. (1982). Country-of-Origin Effects on Product Evaluations. Journal of International Business Studies volume 13, 89–100

29. Wegapitiya, B. M. A. C., & Dissanayake, D. (2018). Conceptual review on country-of-origin effect in international markets. International Journal of Business and Management Invention, 7(9), 12-19.

30. White, C. L. (2012). Brands and national image: An exploration of inverse country-of-origin effect. Place Branding and Public Diplomacy, 8, 110-118.

31. Yang, R., Ramsaran, R. & Wibowo, S. (2017). An investigation into the perceptions of Chinese consumers towards the country-of-origin of dairy products. International Journal of Consumer Studies.

32. Zbiba, I., Ghaddara, R., Samarjib, A. & Wahbic, M. (2021). Examining Country of Origin Effect among Lebanese Consumers: A Study in the Cosmetics Industry. Journal of International Consumer Marketing, 33:2, 194-208, DOI: 10.1080/08961530.2020.1740634

Brand Archetype: Using the Theory of Archetypes for Marketing Communication of Companies in Kazakhstan

Adelya Adilgazieva, Aiganym Zhamanguzovera, Shamshat Zhussipaliyeva, Sabina Kuanysheva

Abstract of research

This work is devoted to the study of brand archetypes and their use in the marketing strategies of companies in Kazakhstan. A literature review was conducted on what archetypes are, their use in marketing, as well as different marketing strategies that already exist and use brand archetypes in their work. The purpose of this research was to determine how companies in Kazakhstan use archetypes in their marketing communications, as well as to determine the difference in strategies between the hotel industry and mobile operators. After the literature review, a methodology design was conducted. To identify the results of the study was conducted a qualitative research method, i.e., interviews with marketing experts of the selected companies. The research revealed which of the selected companies use archetypes in their marketing communications and which do not, as

well as exactly how the two different spheres of companies distinguish between each other. This study will help determine the relevance of brand archetypes in Kazakhstan, how common they are among marketing managers, as well as how they influence the marketing strategy as a whole, and whether they influence it at all. In this regard, we decided to study companies from the inside and conduct interviews with people who create this strategy. The interview questions included information about the company as a whole, the target audience, what channels they use for marketing, values, and whether they know about archetypes and use them in their strategies. According to the results of the study, it was found that regardless of the industry, the theory of archetypes is partly relevant in Kazakhstan, as well as the fact that companies may not consciously use archetypes, using the same marketing tools.

Keywords: archetypes, brand archetypes, Carl Jung, marketing, strategy, communication, relevance, use, interview, research, advertising, hotel, mobile, brand, Sheraton, St.Regis, Beeline, Tele 2.

Introduction

A brand is difficult to define or measure, but all areas of our lives, such as social, economic, and cultural, prove the importance and influence that consumers have on us. It makes a company unique from its peers or adds value to a product. This uniqueness or value lies in recognition, trust, and emotional attachment (Kapferer, 2008). Considering the possibilities of today's world, the brand raises its importance as it becomes easier for people to analyse the face of the company thanks to social media. One of the main goals of branding is to create loyal customers for the company. Through their communications brands are trying to convey their message, influencing the customer by attracting attention and creating a favourable impression (Jones, 2021). This forces companies to try to arouse people's feelings and build an emotional connection with the brand. This goal can be achieved by using various tools from psychology that cling to certain customer feelings, such as emotional motivators (Magids et al, 2015). Mark and Pearson (2001) identified brand components such as core characteristics and brand value, which they linked to brand archetypes. They were able to describe the main advantages

of the brand archetype over characteristics and just a good product - uniqueness and consumer loyalty. With a foundation from psychology, brand archetypes help create a connection with people by giving them an image of a certain archetype. Dividing them into the very motivators that use customers' motivations. Brands are a major part of a country's overall economy and Askhat Uskembayev in 2022 mentions the importance of this specifically for Kazakhstan. Strong and potential companies are created with competent company branding, who use their values, image and most importantly communication with consumers as tools to build healthy relationships with customers. Using primitive strategies connected with the most favourable prices without the company's image is detrimental as in the end by applying the same type of communication with customers, the company loses its place among the competitors. For the sake of a competitive market, it is important to have a good brand strategy (Kapital, 2022). For branding analysis in Kazakhstan's market, this study examines the theory of Brand Archetypes. Namely, examining the marketing communications of Kazakh companies will allow finding out if the theory of brand archetypes is being used at all.

Literature review

3.1 Archetypes

The origin of brand archetypes is a concept studied and defined by psychotherapist Carl Jung in 1919. In the course of his research, Carl Jung (1968) discovered that regardless of the culture of origin, all characters in legends have certain characteristics that are unique and have a special appeal. Also in Jung's psychological structure, archetypes are innate and universal prototypes of ideas that can be applied to interpret observations. Jung described the personal unconscious in his book as the top layer which deals with the result of experience, and the next, which deals with innate data, is the collective unconscious. The archetype, on the other hand, is an important part of the collective unconscious, which has its origins in ancient times and myths that are part of the human psychic phenomenon. Jung himself has both followers of his theory and critics who refute his theory. One critique of Jung's theory is Herskovitses in 1958, who emerged after criticism

from Weston La Barre in 1948 and cited him, considered Jung's archetype theory as mysticism. Weston La Barre criticises the use of symbols and ethnocentrism in Jung's work. Referring to the inheritance of symbols through the ontological method in the process of socialisation as correct rather than not phylogenetically (Drake, 1967). The main followers who have shown the importance of Jung's theory are Margaret Mark and Carol Pearson who have shown that the archetype can be a compass for marketers looking for a path for their brand. They described a total of 12 archetypes, divided into 4 human stimuli in Table 1, which are thus divided into consumer goals or desires. These 12 archetypes were depicted as ancient gods, who could convey the image and meaning of each. Over time, it is easier for us to associate them with ordinary people or characters, but this does not change their image and character. These archetypes are the link between the brand and customer motivation, giving meaning to the product (Mark & Pearson, 2001). The main purpose of the brand archetype is to use people's subconscious to create a sustainable and emotionally appealing brand. Although the authors have used extensive case studies and originality in their work, some opinions see flaws in this theory. The theory related to the psychology of people causes difficulty in understanding it, which makes it difficult to become part of the marketing lexicon. (Magrath, 2001). Sukhenko, in his preface to the publication, noted that this theory of archetypes is much more complex and more than just the 12 attributes that are presented in the book (Mark & Pearson, 2005).

Today, brand archetypes have not lost their relevance for marketing and continue to occupy an important place in companies. By adapting theory to brand development companies are changing archetypes or using different types at the same time. Brand Archetypes are used by companies to retain customers by building a pathway with revealing archetypes one by one, for the sake of customer satisfaction at different stages of their interaction with brands (Merlo et al., 2022). For the archetype method to be successful, a brand must match its history, characters, and values with the archetype it conveys to customers (Siraj & Kumari, 2011). The translation of the archetype has the result of creating a specific meaning, e.g., using the words and phrases in Table 2 having an association with the company meaning it is possible to refer to the brand archetype (Roberts&Marshall, 2014). For example, the Nike brand, from its founding history by athletes who loved to achieve goals to representatives like Jordan or Tiger, exhibits a heroic brand archetype. Adidas' main competitor with its slogan 'the impossible is nothing' also embodies the heroic archetype, ready for a challenge (Laub et al., 2018). Hero and Outlaw mention the dominance of the heroic archetype among sports brands. The hero archetype, on the other hand, tries to make the world a better place through challenge and achievement (Mark & Pearson, 2001).

Table 1   Archetypes and Motivation

Archetypes and Motivation				
Motivation	Stability & control	Belonging & enjoyment	Risk & mastery	Independence & fulfilment
	Creator	Jester	Hero	Innocent
	Caregiver	Regular guy	Outlaw	Explorer
	Ruler	Lover	Magician	Sage
Customer Fear	Financial ruin, ill health, uncontrolled chaos	Exile, orphaning, abandonment, engulfment	Ineffectuality, impotence, powerlessness	Entrapment, selling out, emptiness
Helps People	Feel safe	Have love/ community	Achieve	Find happiness

Note: Reprinted from The Hero and The Outlaw: Building extraordinary brands through the Power of Archetypes (p 18) by M. Mark, C. Pearson, 2001, New York: McGraw-Hill.

Table 2   Archetypes-related sentences and words

Archetype	Sentence	Word
Sage	"The truth will set you free"	Learning, Expert, Credibility
Innocent	"Free to be you and me"	Optimism, Simplicity, Goodness
Explorer	"Don't fence me in"	Freedom, Adventure, Independence
Ruler	"Power is not everything. It is the only thing"	Power, Control, Authority
Creator	"If it can be imagined, it can be created"	Creativity, Innovation, Vision
Caregiver	"We live to serve"	Friend, Care, Protection
Regular guy	"Love their neighbour as yourself"	Democracy, Regular, Empathy
Lover	"I only have eyes for you"	Sensuality, Pleasure, Intimacy
Jester	"A life without fun is a life half-lived"	Enjoyment, Humour, Relaxation
Hero	"Where there's a will, there's a way"	Not considered
Magician	"It can be done"	Not considered
Outlaw	"Rulers are meant to be broken"	Not considered

Note: Reprinted from The Hero and The Outlaw: Building extraordinary brands through the Power of Archetypes by M. Mark, C. Pearson, 2001, New York: McGraw-Hill.

Table 3   Archetypes Descriptions

Caregiver	Caring, compassionate, generous, protective, devoted, sacrificing, nurturing, friendly
Creator	Innovative, Artistic, inventive, non-social, a dreamer looking for beauty and novelty, emphasises quality over quantity, highly internally driven
Everyman	Working class common person, underdog, neighbour, persevering, candid, wholesome, cynical, realistic
Explorer	independent, free-willed adventurer, seeking discovery and fulfilment, solitary, spirited, indomitable, observant of self and environment, a wanderer
Hero	Courageous, impetuous, warrior, noble, rescuer, crusader, undertakes an arduous task to prove worth, inspiring, the dragons layer
Innocent	Pure, faithful, naive, childlike, humble, tranquil, longing for happiness and simplicity, a traditionalist
Jester	Living for fun and amusement, playful, mischievous comedian, ironic, mirthful, irresponsible, prankster, enjoys a good time
Lover	Intimate, romantic, passionate, seeks to find and give love, tempestuous, capricious, playful, erotic
Magician	Physicist, visionary, alchemist, seek the principles of development, interested in how things work, teacher, performer, scientist
Outlaw	Rebellious iconoclast, survivor, misfit, vengeful, disruptive, rule-breaker, wild, destructive

Ruler	Strong sense of power, control, the leader, the judge, highly influential, stubborn, tyrannical, high level of dominance
Sage	Values truth and knowledge, the expert, the counsellor, wise, pretentious, philosophical, intelligent, mystical
Shadow	Violent, haunted, primitive, tragic, rejected, awkward, darker aspects of humanity, lacking morality

Note: Reprinted from The meaning of a Brand? An archetypal approach (p 21) by D. Xara-Brasil, K. Miadaira Hamza, and P. Marquina, (2018), Revista de Gestão, 25(2), 142–159.

3.2 Marketing Communication and Brand Archetypes

Marketing strategy is the basis of a company's marketing activities. Harvard professor Borden (1997), described his concept of "marketing mix" - product, price, place, branding etc. He pointed out the importance of these elements in marketing communication. Brand advertising requires consistency with the overall brand strategy. Marketing communication can be done through traditional marketing or digital marketing. Traditional marketing refers to the method of using traditional or offline channels to promote a product. Traditional marketing methods include print advertising, outdoor advertising, broadcast advertising and telemarketing. Digital marketing, on the other hand, includes methods such as social media, search engine optimization, email marketing, content marketing, apps, and web marketing (Bharti & Kumar, 2020).

Companies must work on brand reputation by creating an image of a trusting relationship with customers. To build a strong connection, it is necessary to present the customer with the mission and values of the company. Currently, the most popular activity for people around the world is browsing social media. As of 2023, Facebook has 2.9 billion users, YouTube has 2.5 billion users and Instagram has 1.4 billion users. Brands are therefore actively using these channels for promotion, and communication (Voorveld, 2019). Well-constructed communication and brand awareness have a positive impact on consumer loyalty and perception of product quality (Schivinski & Dabrowski, 2015) Consumers consume information while on the road, listening to the radio, just relaxing, watching TV at home or work, and browsing the vast expanses of the Internet that are filled with brand messages (Rossiter et al., 2018). These rapid technological changes are also affecting the culture of every nation. As society moves from the tangible to the intangible, brands are increasingly required to be intangible, to increase and demonstrate their value to somehow compete in a rapidly growing market (Twitchell, 2004) Archetypes, on the other hand, are symbolic images that allow people to connect their underlying beliefs and attitudes with politics, sports or some other way of life and reinforce their position in the same politics. Furthermore, they serve as a point of contact for all people divided by their beliefs (Vitor et al., 2021).

Mark and Pearson (2001) presented archetypes as a method of meaning management, which is an important company asset. To be effective, the use of archetypes is important to analyse the market and external factors, Hwang (2017) in her study showed the difference between marketing communications and archetypes in different regions. Archetypes are also used in branding, for example, a study on Archetypes of Service innovation compared archetypes and emphasised the value of companies, where they analysed innovation practices combining archetypes that had previously been investigated separately (Helkkula et al, 2018).

Advertising is an important part of customer communication for brands. It is used not only to promote the product itself but also to create an image for the brand itself. Through the main brand and creating an association for customers about the brand (Belch & Belch, 2018). The archetype can manifest itself through commercials, for example, one of the iconic Marlboro Man ads depicts a young male cowboy riding a horse courageously through a meadow/grass, demonstrating the archetype of a seeker (Siraj & Kumari, 2011). The seeker manifests a desire to travel and break free. This archetype gravitates towards wild landscapes and wide-open spaces that call for new adventures (Mark & Pearson, 2001). Thanks to advertising, it is possible to find

a response from customers who find something close to them. Another advertising project from Anita Santiago Advertising, Inc. for the 1996 "Generations" campaign of milk processors. The company was faced with a project that specifically targeted Mexican Americans. For the right concept, one had to understand and adjust to the consciousness of the consumers. In the same case, the ethnographic interview method was used to understand the consciousness of Hispanic families. Using the Caring brand archetype (Jungian mother archetype), the company was able to find a positive response from the audience through their consciousness. Demonstrating real caring through the grandmother, granddaughter and their product awakens the memories and values of their customers (Masco-Fleischman, 1997). Research on "The difference in brand archetypes between Western and Asian tech brands" proves the importance of adapting the brand to the market country. Brands should pay attention to market consciousness when developing an archetype or narrative about themselves (Hwang, 2017).

Definitional analysis of brand advertising or content can also be used in the study of the brand archetype. An advertisement by luxury brand Dior for the perfume Sauvage feat Johnny Depp shows him leaving the city and digging in the desert with the words 'I do not know. What am I looking for?". These actions and his phrases converge with the Explorer archetype, as his main goal is freedom and exploring the world. With the right analysis, the company was able to convey the meaning of its product 'Sauvage', which represents a powerful masculine fragrance (Sokolova&Kuzina, 2019).

Research methodology

Brand archetypes are presented as the most important part of our study because they are a psychological factor in communicating information and brand personality, help influence target audience choice, and show how a well-designed advertising strategy increases a company's success. In the previous chapter, we detailed the relevant literature for our study, the history of brand archetypes, and how they influence advertising activities and brand perception through communication with consumers. Therefore, thanks to the studied literature that showed us researched foreign companies such as Adidas and Nike that used brand archetypes in their marketing strategy, and were successful in their strategy (Laud et al, 2018), we came to research questions and research objectives of our study, to explore whether and how to use the brand archetype theory in their marketing strategies of companies in Kazakhstan. In the posed question we can also see the purpose of this research, there are many studies and stories about how foreign companies convey their brand personality through the use of brand archetypes, we also decided to study how popular companies in Kazakhstan use the psychological factors of archetypes in their marketing communications (Hwang, 2017). Our research question is:

1.   How do companies in Kazakhstan use the theory of archetypes in marketing communications?

The objectives of this study are:

1.   Analyse past marketing communications and current strategies and identify companies' archetypes.

2.   Determine the relevance of the application of brand archetype theory in marketing in the companies in Kazakhstan.

Selected companies:

-     Beeline

-     Tele 2

-     Sheraton Astana

-     St. Regis Astana

The purpose of this chapter is to discuss the methodology that we produced, given the objectives of our study. Consequently, we will use this to study the marketing communications of companies in Kazakhstan, to present the methods that we use to collect and analyse data, and further to come to relevant conclusions. This research is conducted using qualitative research methods. The purpose of the qualitative research is to better understand what the companies in Kazakhstan base their strategy on, whether they have a division into archetypes and whether they try to influence the consumer audience with the use of psychology. A similar research method was based on a study of hotel marketing from a research paper (Bechter, 2016). Our research method is different in that our main focus group is not audiences and consumers, but people from within, such as the marketing managers of the selected companies. We decided that we need people who know

their business and are familiar enough with the company, we focused on employees of the selected companies, who had different positions, but the same responsibilities, all of them were competent in marketing communications and marketing strategy in the companies.

These companies were chosen after careful research and review of the marketing of companies in Kazakhstan, regardless of industry. We focused on the number of users, the quality and activity of advertising, as well as companies with high-profit margins and interesting stories because mobile communications and the hospitality business are the industries that every country needs both for economic and tourism growth and for general use. These are the kinds of companies that put meaning into their marketing and broadcast that message through their advertising, attracting more and more consumers. Some of the leading mobile operators in Kazakhstan include Beeline and Tele 2, and they also have quite creative advertising (Halyk Research, 2021). We also selected 2 hotels from the same Marriott hotel chain, these are Sheraton Astana and St. Regis Astana, which are based on the business segment. These companies were divided into different industries as we wanted to explore different industries to compare the use of archetype theory in the selected companies and out of them we selected 4 companies for two reasons, to conduct a better analysis of these companies in a short time and also because these are the companies whose managers could be contacted more or less easily.

To understand the use of these companies' archetypes, we conduct careful research on the selected companies, studying their background, the marketing strategies they have used in the past, and the strategies they are currently using. We also studied various sources of their marketing activities, such as social media and official websites (Table 5), to get data on the advertising strategies they use to reach their target audiences. And we will analyse exactly how these companies influence audience selection in their favour, and what archetypes, and marketing strategies they use.

For qualitative research, we did interviews with marketing managers. We found out how aware company managers were of marketing communications, what the most important methods of communication were, what the emphasis was in advertising campaigns, and whether managers were aware of what archetypes were, and what archetypes the companies in which they worked represented themselves as. Also, to develop our interview questions, we did a content analysis that helped us see the situation of a company's marketing communications before the interview and also showed us what archetypes companies exhibit in their advertising and various communications in Table 5.

Table 4   *Interview Questions*

Units:	Questions
To learn about a person, and his position.	Name Position in the company
Questions to discover about the company, their marketing principles and target audience	1. How would you describe your company(main qualities)? 2. Who is your main client/TA? Describe this person's approximate activities 3. What should your customers think and feel when they hear about your brand? 4. What is your competitive advantage and how do you emphasise it in communications? 5. What is your core value? 6. What communication channels do you use to promote your company's brand? 7. Are there any channels of communication that you do not use? Why not? 8. How would you describe the tone of voice of your brand? 9. How do you think it would be most effective to promote your company? 10. What are the main strategies your company uses in its advertising communication?
To find out if the person knows about archetypes and what archetypes the company translates.	1. Have you heard of Carl Jung's archetypes and theories of the 12 brand archetypes? 2. What do you know about archetypes? 3. Do you think it is important to use archetypes in any company's advertising communication? 4. Does your company use any archetypes? 5. If so, does the company tailor its archetypes and advertising principles to each region and its target audience?

Integrated communication is all about communicating a whole marketing message in such a way that every potential customer can receive and understand the information. An integrated communications strategy is also very important to building a company's brand image. Because all of the pieces contained in the brand will be integrated and more easily recognized by customers, this type of communication is also necessary to improve the customer experience before they come to the transaction. In the world of high-level business, every group of people are not just looking for the thing or organization that they want; they also want an experience that can truly satisfy their desire. (Kitchen and Burgmann, 2010)

The Archetype brand emerged from Carl Jung as a system for creating individual positioning on the target audience. Marl&Pearson (2001)

emphasise the importance of holding the right brand value by marketers to be successful.

Background information analysis

5.1 Tele2

The history and creation of the company began in 1970 in Sweden. Jan Stenbeck, son of the founder of the Swedish investment company Kinnevik, was developing the telecommunications business. The company's main principle was to create a network that would be accessible to everyone. Tele2 is the leading mobile operator at the moment. The main principles of this company are:

1.   Benefit

2.   Availability

3.   Flexibility

4.   Speed.

These principles enable the company to

provide its customers with the most profitable communication. The most important principle which is focused on is profitability and availability. Tele2 is not only having favourable tariffs and fast Internet with 5G coverage. In 2022, Tele2 and Altel won the auction for connection of 5G coverage. Within five years, the company plans to install 7,000 base stations and provide fifth-generation mobile communications throughout Kazakhstan (Forbes.kz, 2023)

The current marketing strategy does not differ from the old one, as the main objective is affordable prices and benefits. For the consumers of this cellular operator, they provide favourable tariffs for convenient communication without limitations. Thereby attracting more customers to this network. An ecosystem has been created for choosing the most suitable tariff plan and to increase the loyalty of Tele2 subscribers. The result will not only be a convenience for customers, stimulation of the flow of new customers and additional growth of revenues and profits for the company. Tele2's marketing strategy is to offer attractive, affordable, simple, and honest offers for its subscribers.

5.2 Beeline

In 1992, Russian scientist and entrepreneur Dmitry Borisovich Zimin, together with his companions Konstantin Kuzov and American Augie K. Fabela II, created Vimpel-Communications. VimpelCom received a licence in 1993 to create a cellular network, and in 1994, a new brand called Beeline was registered. Beeline became the largest cellular operator in Russia, connecting 10,000 cellular operators in the first year of operation. Beeline's cellular service currently covers countries such as Russia, Kazakhstan, Georgia, Kyrgyzstan, and Uzbekistan. According to VimpelCom's official annual report, the Beeline brand has 44.8 subscriptions for 2022 (Beeline.ru, 2023)

The official start of commercial activity under the Beeline brand in Kazakhstan was in 1998, founded by KaR-Tel LLP. To improve cellular communications and wide coverage in Kazakhstan, Beeline installed more than 4,000 base stations throughout Kazakhstan in 2022 as part of the company "LTE everywhere," also thanks to which 4G is now provided in 1,000 settlements and villages. More than 80 of the installed base stations increase the track coverage. Today 4G is available in 97% of all Beeline coverage (Profit.kz, 2023)

As a result, we can conclude that the value of the company consists of:

1. Simplicity
2. Convenience
3. Simpler
4. Faster.

5.3 Sheraton

The Sheraton was founded in 1937 by Ernest Henderson and Robert Moore. They aimed to open a chain of hotels so that everywhere there was a standard in the service of visitors and by 1965 the number of hotels was 100 (Zachary, 2017).

Sheraton executives decided to spend $1 billion to renovate the hotel that was bringing in the company's main income because it was old, and worn out, and visitors only went there when necessary because of its convenient location in the city. The company had a promotion specifically for cab drivers. The purpose of this action was for cab drivers to know all addresses and new hotel names, to take tourists to these hotels. Marketers have put an animator in a Hawaiian shirt who handed out cupcakes, and coffee with new hotel names to cab drivers. The company also raffled off trips to Hawaii among the cab drivers. The Democratic National Convention was held in New York City, at such an event there was to be a rush of guests and rebranding the hotel played into the hands of the company. Headlines in the newspapers read, "The hotel was spending $100 million to renovate and become the new Sheraton New York Hotel & Towers, and we are completing the renovation in time to serve as the headquarters for the Democratic National Convention." Thanks to this promotion, there has been an increase in interested parties for room reservations (Leora et al, 2016).

Currently, Sheraton has more than 450 hotels worldwide, in more than 70 countries. The first Sheraton brand hotel with all amenities opened in Kazakhstan in 2020. The hotel is located in the city centre, next to the Abu Dhabi Plaza shopping centre. "Where The World Comes Together" is a phrase that means the hotel unites people with common interests so they can create ideas and bring them to life (Sheraton Careers, n.d.) Sheraton is considered a luxury hotel in Kazakhstan. Rooms at the Sheraton start at

about 40,000 per night. Guests of the hotel are usually foreigners, tourists, or businessmen. Also, young couples who want to hold their wedding there. The Sheraton shows care for its guests, makes it easy to get to know them and helps visitors feel better about themselves.

5.4 St. Regis

St Regis is a hotel founded in 1904 by the famous inventor John Jacob Astor IV in New York City (History and Heritage, n.d.) This hotel has hosted some of the most influential people like Carnegie, William Paley, and many others. For such talented people, the hotel offered special facilities and services, and they provided butler service. Since that time, they have tried to use technological innovations such as using a telephone in each room so guests can communicate at work and with loved ones. Also, in The New York Times hotel ST Regis was named "Best Hotel in America. In Kazakhstan, the St. Regis is currently a five-star hotel. Room rates start from 70,000 tenges per day. The main client base consists of foreigners, businessmen and

tourists. Hotel St. Regis Astana combines luxury with the hospitality of the Kazakh people. There are currently 120 luxurious rooms, 7 banqueting and business meeting rooms. St. Regis Astana also has butler service, which is their distinctive service. This hotel is for those who love style, sophistication, and passion for innovation. St. Regis is working with famous designers and fashion magazines. For example, with designer Delphine Delettre and BEYOND magazine. As a result, the hotel aims to be luxurious, expensive, and classified as a premium class.

Company analysis based on marketing communications

The company's data analysis period was covered from January 2023 to May 2023. Social media posts covered channels such as Facebook, and Instagram from the official accounts of the selected companies. Taglines analysed were published on official websites and billboards. Advertising is analysed based on the targeting advertising broadcast on YouTube and Instagram.

Table 5   Analysis based on marketing communications

Tools	Social Media posts	Tagline	Advertising
Sheraton	Sheraton Astana's Instagram @sheratonastanahotel has many services for guests. All services are presented as customer care. For example, the Sheraton offers a leisurely breakfast, a lounge by the pool, a relaxing massage and self-care. The hotel also promotes its services for events such as weddings. The Sheraton team will take care of every detail of the event. The newlyweds and their guests will enjoy a pleasant evening. As well as organising the wedding, they also arrange a photo shoot to capture the happy moment. Sheraton also cares for pregnant women and offers them aqua aerobics classes in the pool, as it is good for their health	"Where the world comes together." This is a quote from the main mission of Sheraton. The hotel thus says that they care about the time spent in the hotel and the socialisation of guests.	The hotel advertises fitness and spa services. The video shows the inside of the hotel, the swimming pool, and the gym. Also, romantic videos of the bride and groom on their wedding day, showing the setting of the hall, were filmed in the hotel's best locations.

St.Regis	On Instagram @ stregisastana in posts, there are often expressions like "feel the luxury", immerse yourself "in the world of art", exquisite atmosphere, luxury suites, etc. They raffle off tickets to the ballet, held sophisticated evenings and invited jazz musicians. They also promise that weddings and events of all kinds at this hotel will surpass all expectations, at the highest level.	On the St.Regis website, phrases such as: "Celebrate an Exquisite Journey", "An Innovative Spirit." Show their superiority, something that is for the upper class of society.	St.Regis works together with fashion magazines, giving their location for photos that are released or promoted on social networks. For example, at the moment they are working with the publisher of Beyond magazine. One such commercial features a model with jewellery, an expensive car, and a dress in a ballroom. The clip was accompanied only by a melody and at the end by a golden hotel logo
Tele 2	In their official social networks, the company Tele2 can be seen as their main character in the ads. One of the most recent popular posts on Instagram and Facebook is the main character of Tele2 ads. A simple guy with an ice cream cone in his hand and the slogan "more with us - more internet". The ice cream in the young man's hand is not just for a reason, this ad carries the message that every consumer can have as much as he wants.	In recent commercials for Tele2, the main character is an ordinary guy who struggles with high prices, and excessive spending. The image of this hero is a man who rationally controls his expenses, helps people and helps them choose a profitable tariff. The "Outlaw" archetype can be compared to their slogans, such as: "cheaper with us", "go to the side of bargain offers", "your rules", and "don't let yourself pay more".	A "Mix Subscription" advertisement was published on April 12, 2023, with the slogan "Customize as you like". The advertisement shows that each Tele2 operator can set up their tariff plan as they see fit. Each client can set their own rules and pay only for those functions (SMS, minutes for calls, gigabytes). "Do as you like" is characterized by the "Outlaw" archetype.
Beeline	In their official social networks, such as Instagram and Facebook, Beeline not only notifies subscribers about new tariffs but also publishes useful posts. Such as interviews with popular speakers, implementation of projects to install Internet towers in rural areas, tips for leisure time, etc.	The main slogan of Beeline is "live on the bright side", which fully corresponds to the demand of customers and the philosophy of the company itself. The main target audience of the company is people with an active life position, with a family, children, with various hobbies and different interests. Living in this information noise, this category of consumers is really in demand, ready to consume advertising.	The Beeline HomePlus+ ad published online on May 2, 2023, shows us people from different societies, statuses, genders, and ages. The main message is that no matter who you are, their services and cellular communications can be made available to absolutely everyone. As quoted in "The Hero and Outlaw" to the "regular guy" archetype.

6.1 Conclusion of the analysis

Beeline - By analysing the main communications of Beeline we concluded that the company broadcasts the same values that are characterised by the "regular guy" archetype. This archetype is used by brands that support simple human values, such as kindness, simplicity, loyalty, and honesty; Share common interests and values with customers. Thus, classified this company as a "regular guy" archetype, whose communications are very harmonious and create a sense of community and good neighbourliness (Karolina, 2021). A company's communication with customers helps shape behaviours and perspectives that allow the individual to be part of a group and value all people, not just those who stand out and stand out. As quoted in "The hero and outlaw" to the "regular guy" archetype, "Individuals and groups, companies and partnerships-big and small receive the same quality service and care." (Mark & Pearson, 2001, p.171).

Tele2 - Also, having analysed the main communications and position company Tele2 in recent years, we can conclude that they emphasise standing up for extra pay. Their goal is to make sure that consumers can use their network at affordable prices and that it is of high quality. They oppose those old rules and create tariff plans that consumers themselves can adjust as they feel comfortable and profitable. They were the first to produce such changes and created the rule "so it's convenient for consumers. That is why we categorised the company as an "Outlaw" archetype. The company positions itself as someone who goes against the rules. Thus it confirms the archetype of the outlaw who says "rules are meant to be broken" (Mark & Pearson 2001, p. 123).

Sheraton - Hotel has the archetype of the "caregiver". The Sheraton's mission is to bring people together, to make it easier for them to meet. To make guests feel comfortable, to accompany them. The staff are also very friendly and always ready to help. On the Instagram page, @sheratonastanahotel, their posts have descriptions with the context of impeccable service and individual approach to each client. A study of Product form design using the theory of Archetypes, explains that the caregiver demonstrates maternal traits and goes above and beyond to ensure that people are cared for in the best possible way. (Shieh, et al).

St.Regis - "Ruler" is characterised by a solid sense of control and power. As well is represented as the judge, the boss, and the coordinator (Xara-Brasil et al, 2018). St Regis puts more emphasis on luxury. Gives guests a sense of high status, and authority. They provide access to luxury rooms, and restaurants and hold high-level business meetings. They find an individual approach to each client. On the Instagram page @stregisastana, you can see that the texts are written in an official business style. In this context, they talk about their "luxurious" halls for the event, also about the "exquisite" dishes they can offer, etc. In conclusion, we can say that St Regis has the archetype of a "ruler".

Interview

Similar questions were asked to obtain effective data for comparison and analysis. In Zoom and face-to-face format about 17 questions were asked in total, divided into 3 blocks. An in-depth interview was conducted with Zhamal Mukanova Marketing communication manager of Sheraton, Dinara Usinalieva Marketing Communication Manager of Beeline, PR Director of Tele2 Evgeniya Bekbulatova and Marketing Manager of St.Regis Aidana Aidarkina. To find out the result of this study it was necessary to find out the main methods of communication of each company, what marketing strategies are used and whether they use archetypes concepts in their brands. The main purpose was to find out if the concept of archetypes itself is relevant if the Kazakh companies understand and use the theory of archetypes.

Having interviewed all the selected companies we found out that the theory of brand archetype in communications is not actual for all of them. While found the assumptions that the theory of the management of the meaning of the brand archetype is not used or is not relevant by the selected companies, but the company has its brand archetype, based on the analysis of communications campaigns and answers to questions. Brand value is an indispensable asset and regardless of the product, everyone wants to have some kind of value in front of an audience. The Brand Archetype by Mark and Pearson (2001) represents already the very system to manage this meaning. The research was conducted on the hypothesis that audiences perceive archetypes in different cultures and art (Faber & Mayer, 2009). Which shows the

presence of archetypes in different continents. The brand archetype originally came from psychology, namely the collective unconscious, as common programmed thinking (Jung, 1968). Communication for each of the brands surveyed has a major role, as all responded that they use all types of communication. All companies noted the use of all channels of communication, and Sheraton and Beeline emphasised the 360-degree activation method. Sheraton noted that in this method, each channel has its purpose, for example, through the in-house they use everything to create an atmosphere for their main value - the community and familiarity with the care of their guests, namely using only furniture to communicate a few people, everywhere vertical and horizontal offers from the hotel. In addition, the event communicates with potential customers, such as inviting brides and grooms with offers to visit their hotel and take care of their wedding. Although they initially indicated that they are a business hotel aimed at business travellers, they added that they have potential customers through extensive communication and expansion of the hotel itself, such as the largest spa in town and the opening of new restaurants. Having a large number of channels and communications The Sheraton Hotel noted that they do not use the archetype theory in their marketing because they do not consider it applicable. Even though Sheraton mentioned that the archetype is not relevant, the answers to the questions about the communication were analysed through the description of the attributes of the archetype for comparison with the preliminary analysis of the communication. Zhamal Mukanova said: "Business hotel. A hotel you can always turn to, comfortable, convenient, staff are friends, the interior is for community and communication. Hotel "business" is the motivation of stability and control, and "comfortable", "comfortable" is associated with a sense of security in Table 1. The value of community - the desire to create communication is associated with the description of friendly in Table 3, which is the caregiver archetype. To summarise, the marketing communication analysis archetype and the interview analysis archetype is a caregivers. In comparison, the Sheraton St.Regis Hotel noted the importance of the brand archetype in its operations. St.Regis emphasised the embodiment of the archetype of the ruler everywhere, as a

preliminary analysis of the communication of this hotel. The ruler archetype represents the image of power and luxury that they want to broadcast in their communications. Their goal is to provide world-class service and a high-quality approach to their guests. And when asked about the use of archetypes, Aidana Aidarkina noted that: "We adapt our archetypes and advertising principles to each region and target audience." Taking care of customers, the brand adapts brand archetype and communication depending on its audience and region, believing that each country in which they operate has a distinctive culture and reaction to the symbols/messages. The hotel uses exquisitely luxurious locations, and partnerships with influential people in all communication channels, but noting the importance of it is the luxury lifestyle magazines, travel publications and social media platforms.

The sphere of mobile communications as well as hotels showed different results in the use of the brand archetype in their communications. The brand that considers itself the first in this field is Beeline, which has an ecosystem with multiple offerings, such as digital products for different customer audiences. Through communication, they carry the value of the company to make people's lives better. The character of the brand is an open person, dynamic, active, engaged in its development, close with a good sense of humour, as a friend offers beneficial useful services. Beeline has many products, and archetypes are also divided in each sub-brand, for a different segment or service. As an example, was given the service BeHome +, which included fixed TV and Internet, here the target audience is a married couple from 25 to 50. For this audience, the archetype of "caring" is given the best offers, which will cover their needs. For the target audience of 20 to 35 years old, who develop, study, and build a career there are advantageous tariffs only with the Internet. In this case, Beeline uses the "regular guy" archetype. In addition to segmentation by audience and product, the company also divides by the region of Kazakhstan, as demand may be different depending on location and mentality. This is done by demand testing and confidential analysis. According to the analysis of marketing communications, concluded that the archetype of Beeline is a "regular guy", also according to interviews it was found that the company uses the archetype of a "regular guy".

Tele2 positions itself as a company that "challenges". The main objective of the company is to provide consumers with favourable and quality services. This is the first company in Kazakhstan, which won the tender for installation of high-speed 5G Internet. Target audience: Active young people, who value benefits, want to be in trend and spend a lot of time online. People who have a free spirit, always learn new things and are not afraid of change. The marketing department certainly knows and has studied 12 archetypes, but Tele2 is not attributed to a certain type - Evgeniya Bekbulatova said that "the concept of the audacity of Tele2 is in the past, the current focus of brand promotion is to build the benefits and increase resources for consumers. One way or another, the company does not refer itself to a certain archetype and does not use this marketing tool. When analysing advertising communications over the past few years, it can be concluded that they support the concept of the "Outlaw" archetype, as in their slogans there are such expressions as "do not pay extra", "other rules", "following the rules is not in our rules".

Limitations

The study identified limiting factors that influenced this study. The main one was the size of the sample of respondents, namely the number of campaigns and industries. A large number of respondents would increase the accuracy of the results. The reason for this limitation is the time and resources that were available at the time of this study. Find a connection with marketing and communications representatives who would be willing to openly provide personal information, such as full names, positions, and responsibilities within the company, to answer questions to obtain the correct data. Set convenient in-depth interview dates for each of the brand representatives. A related factor was getting complete answers because of confidential information that could not be shared with managers.

Conclusion and Recommendation

This study was devoted to the analysis of the theory of brand archetypes in marketing communications, namely the companies: Beeline, Tele2, Sheraton, St.Regis, and How relevant this theory is in practice amongst companies in Kazakhstan and how they use communications to communicate their meaning. The theory of archetypes has long been established and there are countless cases of foreign companies that have successfully used this theory for their promotion. Campaign analysis and in-depth interviews with brand marketers were conducted to answer the questions. The objectives of the study were achieved. The pre-interview analysis showed the results that were revealed after studying the company's communication, namely the current archetypes. During the process of analyzing the interview data, we can conclude that the companies we analysed from different industries know about the theory of 12 archetypes but not all of them consider that this tool is actually in their marketing strategies. Direct interviews have confirmed the relevance of the theory of brand archetypes partly, that is, 2 out of 4 companies have confirmed and 2 companies have denied the use of the theory in their marketing communications. Regardless of the hospitality and mobile industry, the responses were similar across the interviews. Brands that confirmed the relevance of the archetypes pointed to the same methods of use. The answer to the research question is the audience, segmentation, communication localisation, and brand equity management.

Overall, the study has value in the topic of marketing and the use of brand archetype theory in Kazakhstan, it is possible to conclude about the communication channels used in industries such as hospitality and mobile communication. These results will be useful to marketers and brand managers who are interested in theories about branding and communication. The theory about Brand archetypes can be useful in shaping the design of a marketing strategy and the company would help to build a clear positioning in the marketplace.

Although some companies do not officially use the theory of archetypes, the way they broadcast their values and use certain messages that they want to convey to their customers can be used to classify these companies into a certain archetype. During the analysis of marketing communications archetypes can be identified also with the help of positioning, mission of the company, tone of voice, advertising integration, tagline, and values which they broadcast.

For further research, on the topic of archetype use and relevance, it is recommended to choose more companies from different industries. Since the use of archetypes may depend on the purpose and mission of the company. Moreover, it might

be better to additionally support the research with the information provided directly by the consumers of these brands, to find out if the consumers themselves understand the image of archetypes and if this concept is important when choosing a certain brand. It is also recommended to use quantitative analysis together with qualitative analysis to get more data collection.

References

1. Banet-Weiser, S. (2003). American Quarterly. The Johns Hopkins University Press. https://www.jstor.org/stable/30041967

2. Belch, G.E., Belch, M.A. (2018). Advertising and promotion: an integrated marketing communications perspective. New York: NY McGraw-Hill Education. http://megapro.kazguu.kz/MegaPro/UserEntry?Action=Link_FindDoc&id=40501&idb=0

3. Bechter, C., Farinelli, G., Daniel, R., Frey, M. (2016). Advertising between Archetype and Brand personality. https://www.researchget/

4. Beeline.ru. (2023). History of the brand. https://beelineru.ru/legal/about#/c_1866

5. Bharti, K.P., Kumar, A. (2020). Traditional VS. Digital Marketing: a comparative Study. ZENITH International Journal of Multidisciplinary Research. https://www.researchgate.net/profile/Shyama-Kumari-3/publication/256023093_Archetyping_the_Brand_Strategy_to_Connect/links/5e06b47d4585159aa49f8489/Archetyping-the-Brand-Strategy-to-Connect.pdf

6. Borden, N.H. (1994). The Concept of The Marketing Mix. Journal of Advertising Research. https://motamem.org/wp-content/uploads/2019/07/Borden-1984_The-concept-of-marketing-mix.pdf

7. Drake, C.C. (1967). Jung and His Critics. American Folklore Society. https://www.jstor.org/stable/537409?origin=crossref

8. Forbes.kz. (2023). Sergey Konkov, Tele2, on multibillion dollar purchase of frequencies for 5G, competition and monopoly. https://forbes.kz/process/technologies/sergey_konkov_tele2_o_pokupke_chastot_dlya_5g_stroitelstve_seti_i_monopolii

9. Helkkula, A., Kowalkowski, C., Tronvoll, B. (2017). Archetypes of Service Innovation: Implications for Value Co Creation. https://journals.sagepub.com/doi/pdf/10.1177/1094670517746776

10. Halyk Research. (2021). Telecommunications market overview. https://halykgm.kz/uploads/common/files/5K4wJXVX.pdf

11. History and Heritage. (n.d.). Retrieved from https://st-regis.marriott.com/culture/history-heritage

12. Hwang, S. (2017). The difference in brand archetypes between western and asian tech brands. https://aaltodoc.aalto.fi/bitstream/handle/123456789/28663/master_Hwang_Soo_2017.pdf?sequence=1

13. Twitchell, J.B. (2004). Branded Nation. Simon & Schuster. https://books.google.kz/books

14. Jung, C. (1968). Archetypes of The Collective Unconscious. Princeton University Press.

15. Jones, K. (2021). The Importance of Branding In Business. Forbes. https://www.forbes.com/sites/forbesagencycouncil/2021/03/24/the-importance-of-branding-in-business/?sh=74a81a0167f7

16. Karolina,N. (2021). Ultimate Guide on Brand Archetypes with Examples https://landingi.com/blog/brand-archetypes/

17. Kapferer, J.N. (2008). The New Strategic Brand Management. Kogan Page. http://ir.harambeeuniversity.edu.et/bitstream/handle/123456789/1611/BRAND%20NAME%20PRODUCTS%20New%20Strategic%20Brand%20Management%20-%200749450851.PDF?sequence=1&isAllowed=y

18. Kitchen, J.P., Burgmann, I. (2010). Integrated Marketing Communication. https://onlinelibrary.wiley.com/doi/10.1002/9781444316568.wiem04001

19. Laub, F., Ferdinand, H., Kramer, I., Pätzmann, U.J. (2018). How archetypal brands leverage consumers' perception: A qualitative investigation of brand loyalty and storytelling. Research Gate. https://www.researchgate.net/publication/323855813_How_archetypal_brands_leverage_consumers'_perception_A_qualitative_investigation_of_brand_loyalty_and_storytelling

20. Lanz, L.H., Lesmes,J., Tucker,E. (2016). Rebranding Before the Digital Age: 4 Strategies Used. https://www.bu.edu/bhr/2016/05/24/capturing-media-and-customer-attention-

before-the-digital-age-case-study-sheraton-new-york-towers-and-the-1993-democratic-national-convention-rebranding-strategy

21. Mark, M., Pearson, S.C. (2001). The Hero and The Outlaw: Building extraordinary brands through the power of archetypes. New York: McGraw-Hill.

22. Masco-Fleischmam, R. (1997). Archetype Research for Advertising: A Spanish-language Example. Journal of Advertising Research.

23. Magids, S., Zorfas, A., Leemon,D. (2015). The New of Customer Emotions. Harvard Business Review https://hbr.org/2015/11/the-new-science-of-customer-emotions

24. Merlo, O., Eisingerich, B. A., Gillingwater, R., Cao, J.J. (2022). Exploring the changing role of brand archetypes in customer-brand relationships: Why try to be a hero when your brand can be more?. Business Horizons. https://www.sciencedirect.com/science/article/pii/S0007681322001355

25. Magrath, A.J. (2001). Timeless Marketing. In Review.

26. Profit.kz.. (2023). В Beeline Казахстан подвели итоги 2022 года. https://profit.kz/news/64316/V-Beeline-Kazahstan-podveli-itogi-2022-goda/

27. Roberts, C., Marshall, S. (2014). EXPLORING BRAND PERSONALITY THROUGH ARCHETYPES. American Academy of advertising. https://www.proquest.com/docview/1621400375?accountid=17229&forcedol=true

28. Rossiter, J. R., Percy, L., & Bergkvist, L. (2018). Marketing Communications: Objectives, Strategy, Tactics. SAGE Publications. https://books.google.kz/books?hl=ru&lr=&id=CxtnDwAAQBAJ&oi=fnd&pg=PP1&dq=Rossiter,+J.+R.,+Percy,+L.,+%26+Bergkvist,+L.+(2018).+Marketing+Communications:+Objectives,+Strategy,+Tactics.+SAGE+Publications.&ots

29. Schivinski, B., & Dabrowski, D. (2015). The Impact of Brand Communication on Brand Equity through Facebook. Journal of Research in Interactive Marketing. https://irep.ntu.ac.uk/id/eprint/26433/1/3900_Schivinski.pdf

30. Sheraton Careers. (n.d.). Retrieved from https://careers.marriott.com/sheraton-hotel-careers/:

31. Shieh, M.D., Hsu, F.C., Huang, C.W. (2017).

A Study on the Relationship Between Form Features and Images of Concept Bicycles Using the Theory of Archetype. https://doi.org/10.1007/978-3-319-58753-0_85

32. Siraj,S. Kumari,S. (2011). TheIUP Journal of Brand Management, Vol. VIII, No.3. Archetyping the Brand: Strategy to Connect. https://www.researchgate.net/profile/Shyama-Kumari-3/publication/256023093_Archetyping_the_Brand_Strategy_to_Connect/links/5e06b47d4585159aa49f8489/Archetyping-the-Brand-Strategy-to-Connect.pdf

33. Sokolova, E.D., Kuzina, V.Y. (2019). KEY ARCHETYPES IN PERFUME PRODUCTS ADVERTISING. ООО "Издательский дом "Ажур"

34. Vitor, M.B.M., Pedro, C.P., Bruno, E.S.G. (2021). The Political Campaign of Jair Bolsonaro and The Use of Archetypes on Facebook. Journal for the Study of Religions and Ideologies. http://thenewjsri.ro/index.php/njsri/article/view/6

35. Voorveld, H., (2019). Brand Communication in Social Media: A Research Agenda. Journal of Advertising. https://www.tandfonline.com/doi/pdf/10.1080/00913367.2019.1588808?needAccess=true&role=button

36. How brands are developing in Kazakhstan. (2022). Капитал Центр Деловой Информации. https://kapital.kz/amp/business/104535/kak-razvivayut-sya-brendy-v-kazakhstane.html

37. https://www.youtube.com/watch?v=yXPFRBT1u4c

38. Xara-Brasil, D., Miadaira Hamza, K. and Marquina, P. (2018). The meaning of a brand? An archetypal approach. Revista de Gestão, Vol. 25 No. 2, pp. 142-159. https://doi.org/10.1108/REGE-02-2018-002

39. Zachary, R. (2017). Sheraton Hotel History. Retrieved from classroom.synonym.com https://classroom.synonym.com/sheraton-hotel-history-12078868.html

Crisis Management Initiatives and Contingency Planning Competencies Within the Kazakhstani Companies to Mitigate the Risks and Uncertainty

Dariya Abdrakhmanova, Arshat Alash, Aruzhan Kaliyeva, Ailina Zhakupova

Abstract

The current diploma research work examines the crisis/risk management and contingency planning competencies as well as effectiveness among Kazakhstani enterprises. The mixed research methodology including quantitative and qualitative methods was applied to investigate the current state of risk management practices and contingency planning activities. Overall, 74 complete survey responses and five interviews were collected. The research findings demonstrated that implementation of the crisis/risk management and contingency planning practices have gained considerable attention by the companies in recent years, which was mainly dictated by the political, social and economic factors. Moreover, it was found that risk reporting effectiveness as well as risk investigation, control and monitoring were weak. Also, employee risk awareness and training, employee engagement in risk management practices, training of new employees about potential risks, employee responsibility in risk management and employee risk perception levels were weak in selected companies. In addition, it was found that the main risk factor for Kazakhstani companies was economic factors.

Interview findings demonstrated that risk management and contingency planning practices were influenced by firm-specific and industry-specific factors. Based on the results of the research several recommendations have been made to develop the required competencies in achieving effective risk management and contingency planning practices.

Keywords: crisis and risk management, contingency planning, competencies, risk mitigation.

1 Introduction

1.1 Research Background

The outbreak of the COVID-19 pandemic in China and its spread globally was an unexpected social and health crisis, which influenced not only the global population but also organizations. According to Chen et al., (2021), the role of risk management and contingency planning has increased even more during the COVID-19. The authors highlighted that organizations with the aforementioned capabilities were able to strive and quickly mobilize the organizational resources to cope with the consequences of a virus-induced crisis. Jaworek, Karaszewski and Kuczmarska (2022) examined the risk perceptions and management practices by examining the multinational companies in Poland and Kazakhstan. According to the author, Kazakhstani enterprises perceived currency devaluation as the main risk (70%). Moreover, other risks identified from the research included global events (e.g., recession and financial crisis), performance risks, and governmental policy risks. Global social crises such as COVID-19 were considered as the fifth risk influencing Kazakhstani enterprises. Even though the authors have identified the main risks influencing the performance of Kazakhstani enterprises, information about the measures, instruments, risk management model as well as contingency planning effectiveness of the companies were not addressed.

Given increasing levels of future uncertainty due to global as well as national events, the role of risk management and contingency planning has been increasing. The current situation between Russia and Ukraine has triggered economic and financial sanctions, which have a considerable impact on the performances of the companies. Mami and Kenzheali (2022) reported that the ongoing war has created additional risks for Kazakhstani companies including disruptions in supply chains and transit capability of Kazakhstan, the increase in exports as well as inflation rates, swings and roundabouts.

As Kazakhstan continues its political course of economic integration with the global economy through the facilitation of international trade, foreign investments and joining regional and international trade blocs, the companies that originated in the country are expected to learn how to adapt to changing business environments and mitigating the risks arising from the uncertainty.

Hence, the current research work is intended to analyse the crisis/risk management as well as contingency planning practices implemented by the Kazakhstani companies through the application of mixed research methods such as surveying (quantitative) and interviewing (qualitative) methods of data collection.

1.2 Problem Statement

Current global events influence Kazakhstani companies, which require effective risk management practices as well as contingency planning. However, analysis of previous works on crisis management and contingency planning practices has identified the gaps among Kazakhstani companies. Therefore, the current work is intended to analyse the effectiveness of crisis management and contingency planning practices among Kazakhstani companies, which would lay the foundation for further works related to this topic contributing towards the risk management field in the country.

1.3 Research Questions

1. What are internal and external factors influencing the risk perception and risk attitudes among Kazakhstani companies?
2. What frameworks (international and local) are in place for an effective risk management process in Kazakhstani companies?
3. What are common challenges related to nurturing a risk-averse organizational environment in Kazakhstan?
4. How can Kazakhstani companies mitigate potential business-related and external risks influencing business operations?

Overall, the research work will be developed around the aforementioned research questions, which are expected to bring light on the current state of crisis management and contingency planning among Kazakhstani enterprises, to identify best practice cases and obtain information for developing further recommendations.

2 Literature review

The current section of the research work is dedicated to an analysis of the existing academic literature related to risk and uncertainty management, types of risks arising from the business as well as macroeconomic environments, theoretical frameworks related to risk management and potential benefits arising from enterprise risk management.

2.1 Key Definitions and Historical Overview

The term "risk" in business refers to the degree of change that may occur in the future with a potential negative influence on a firm's operations (Park and Shapira, 2017). Indeed, in the case of risk, a decision maker is aware of the potential outcomes and their probability, which makes a risk measurable (quantifiable). On the other hand, the term "uncertainty" refers to a situation where a decision-maker does not possess any information regarding the outcomes and uncertainties. Thus, it makes uncertainty non-measurable (Johnson and Busemeyer, 2010).

There are two main types of risks such as systematic and unsystematic in financial management, which has a considerable impact on the financial soundness of the companies (Sukrianingrum and Manda, 2020). Systematic risk refers to the type of risk that is common for an entire market or economy (Chen, 2022). Systematic risk influences all market participants rather than a single company. On the other hand, unsystematic or company-specific risk is a type of risk that is inherent to a single company or an industry. Indeed, unsystematic risk can be mitigated through diversification (Chen, 2022). It can be concluded that every firm is exposed to both types of risks based, which make up a total risk for a company. Moreover, it is necessary to note that unsystematic risks are within the control of a firm, while systematic risks are not.

Aven (2016) stated that the risk management process is focused on the determination, assessment and response to the risk factors that arise from business operations of a business. The author identified an effective management process as an attempt to control as much as possible future consequences by behaving proactively.

According to Dionne (2013), risk management has emerged as an important tool for both individuals as well as companies after World War II. Indeed, the emergence of risk management in the post-war period was associated with an expansion of the insurance market. Over the course of financial market developments, new forms of risk management instruments have emerged. The application of financial derivatives as risk management instruments gained popularity in the 1970s due to the rising costs of risk management by applying insurance

market instruments. The regulation of risk management practices among the companies intensified in the 1980s as the companies started aggressive use of risk management practices. As a result, the changes contributed towards the development of different risk and capital management models by financial firms. Dionne (2013) argued that prudent risk management practices failed in anticipating the Global Financial Crisis in 2007-2008.

Due to the failure of the risk management models in anticipating the failure of the financial industry in 2008, new regulations and risk compliance standards were adopted (Ozdemir, 2018). The Basel Committee enforced intensive regulations in the banking and financial sector. It is necessary to note that before the Global Financial Crisis of 2008, the Basel Committee had introduced Basel I and Basel II capital requirements. However, the crisis had demonstrated the insufficiency of these requirements and Basel III requirements were imposed on the banking sphere. Basel III requirements have pushed financial intermediaries such as banks and insurance companies to look for efficiency and achieve high levels of return-on-equity (ROE) given the capital restraints. Hence, most of the financial intermediaries have since been looking for mal capital structures and financial management, which could ensure the highest possible ROE. Apart from the capital restrictions, additional measures have been introduced to improve proactive behaviour, which included the development of effective partnerships between the risk and finance functions to achieve effective capital management through determining optimal risk and return capital strategies. Moreover, the adoption of the International Financial Reporting Standard (IFRS) 9 was another measure to ensure appropriate risk management strategy in companies. Ozdemir (2018) stated that IFRS 9 introduced predictive models of risk measurement rather than accounting-based models, which requires companies to measure Expected Credit Losses (ECLs).

2.2 Risk Management Frameworks and Standards

Furthermore, Popchev, Radeva and Nikolova (2021) stated that disruptive innovations and accelerated digitalization of business processes have contributed towards the emergence of new types of risks that companies have to deal with. In particular, the authors accentuated on the emergence of Web 4.0 and Artificial Intelligence. The general frameworks in risk management such as ISO standards (e.g., ISO 31000: 2018 Risk Management-Guidelines ISO/Guide 73:2009, ISO 31010, USA: NIST SP 800-37 Risk Management Framework for Information Systems and Organizations) were addressed. Based on the ISO 31000: 2018 Risk Management Guidelines, the authors have developed a risk communication model, which is outlined in the following Figure 1:
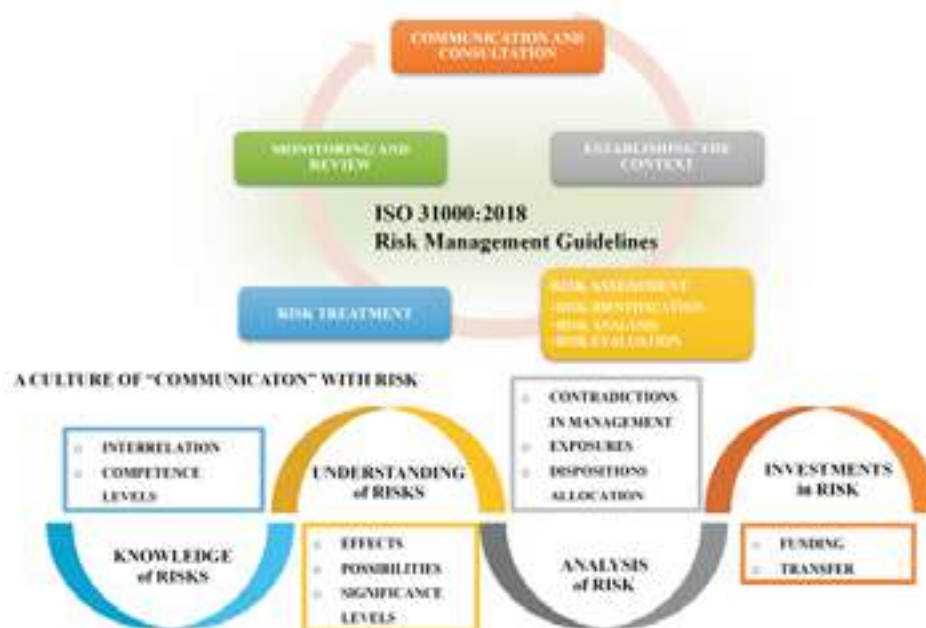
Figure 1: ISO 31000: Risk Communication Culture (Popchev, Radeva and Nikolova, 2021)

Most importantly, Popchev, Radeva and Nikolova (2021) compared the differences between risk management frameworks, which are outlined in the following Figure 2:
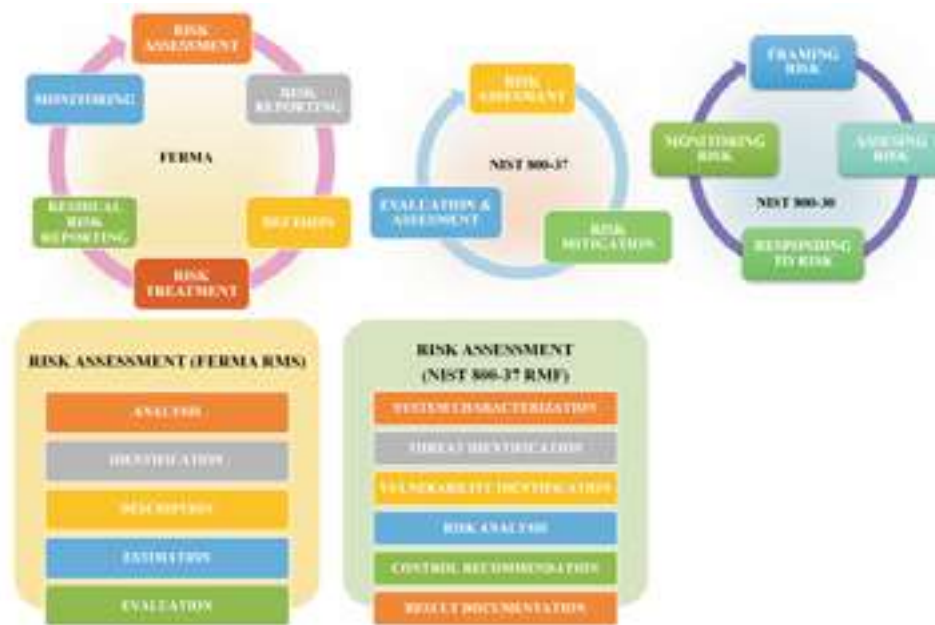

Figure 2: The comparison of different risk management frameworks (Popchev, Radeva and Nikolova, 2021)

FERMA (Federation of European Risk Management Associations) risk management framework consists of six steps, which include risk assessment, risk reporting, decision, risk treatment, residual risk reporting and monitoring. Another hand, the NIST (National Institute of Standards and Technology) focuses on the three most important steps which include risk assessment, risk mitigation and evaluation and assessment. As can be observed from Figure 2, three stages in the risk management model of NIST encompasses several key activities such as the characterization of the system, identification of the threat, determination of vulnerability, risk analysis, recommendations on risk controls and documentation of the results (NIST 800-37). On the other hand, the older version of the risk management model by NIST (800-30), consisted of risk framing, risk assessment, risk response and monitoring the risk (Popchev, Radeva and Nikolova, 2021). All of the risk management frameworks are focused on ensuring effective control over the risks arising from technology usage in business.

Furthermore, Themsen and Skaarbaak (2018) focused on risk management practices in a mega-project to analyse a best-practice risk management framework and risk management technologies in the translation of uncertainties into risks. The authors have classified risks into pure and impure risks. The degree of purity of a risk depended on the interpretation of a risk by a risk consultant. The risks accepted were pure, whereas the impure risks were risks that caused disagreements. Indeed, the longitudinal analysis of the project demonstrated that impure risks challenged risk consultants in a way that the inclusion of such risks and acceptance increased the overprotectiveness of the project. Hence, it was concluded that to ensure effective congruency between risk management practices and technology in projects, it was essential to adjust the technology to changing environments.

A business is exposed not only to external risks, but its actions tend to contribute to an increase/ decrease in risk (Lamine, Thabet, Sienou, Bork, Fontanili and Pingaud, 2020). The process-based risk management has become one of the essential tools in decreasing company-specific risks. One such tool is a Business Process Management and Risk Management (BPRIM), which aligns the risk management process with the process design within the organization:
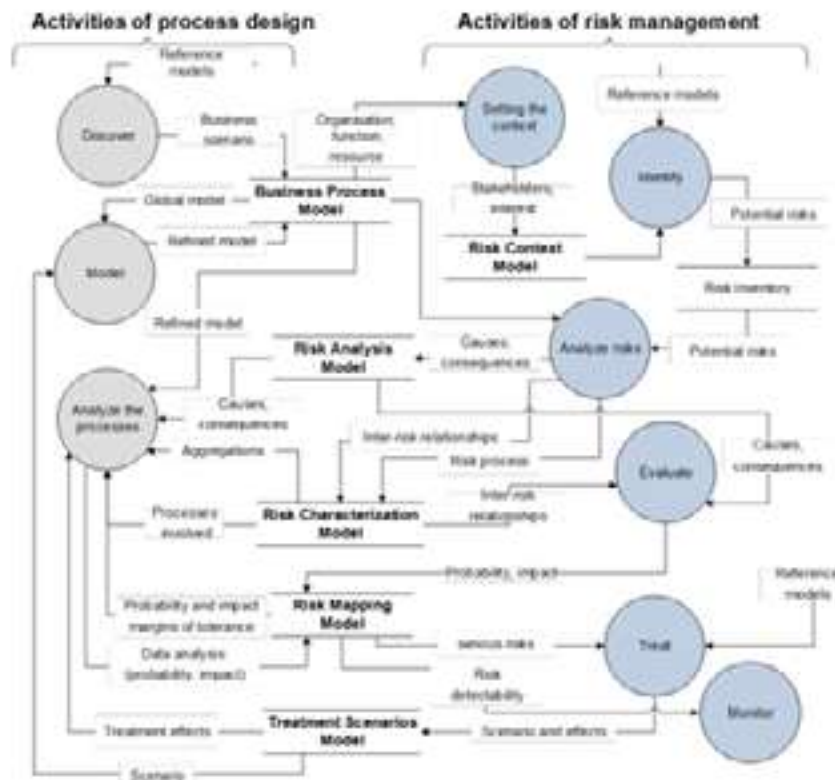
Figure 3: BPRIM framework (Lamine, Thabet, Sienou, Bork, Fontanili and Pingaud, 2020)

Moreover, the risk management approach proposed by the authors is based on four different stages, which are as follows:

1. Contextualize
2. Assess
3. Treat
4. Monitor

The first stage of the BPRIM considers the contextualization of the management approaches of combined management of risks and processes. The assessment stage is focused on the identification and implementation of the joint investigation of how risks and business processes interact. The primary aim at this stage involves risk identification and prioritization. During the treatment stage, it is necessary to determine the set of alternatives that triggers a new type of iteration of the assessment stage. In other words, the treatment stage is focused on testing different alternative options. The monitoring stage is focused on the assessment of whether the undertaken alternative measures complied with the predefined instructions.

Overall, risk management frameworks tend to be different depending on the risk policies, procedures, types of risks and the business environment where a firm operates. Understanding internationally accepted risk management models provides a better understanding of risk management approaches that are commonly implemented by organizations.

2.3 Risk Management Theories

Risk management theories are mostly interlinked with financial and economic theories. Clifford and Smith (1995) addressed hedging as an effective risk management strategy using financial derivative instruments. The authors considered the potential risk management effects by analysing a company's corporate risk management strategy, financing and investment policies. The application of financial derivatives requires thorough investigation and risk assessment based on conducting linear regression analysis. According to Mikes and Kaplan (2014), the contingency theory of an enterprise is a framework, which explains the main motives of an enterprise to mitigate the risk exposure levels. The contingency theory of an enterprise is based on the assumption that there is no best alternative or way of organizing a corporation, governing an enterprise or making decisions. Hence, enterprise management depends on several methods as well as factors that constitute effective corporate governance. Enterprise risk management is one of the corporate governance instruments available

for achieving effective corporate governance. The authors stated that the development of contingency systems within an organization requires a more advanced understanding of not only the nature of relevant risks but also the nature of enterprise risk management. Lai and Samad (2010) defined "enterprise risk management" as "a practice of identifying, evaluating and mitigating the contingencies that arise from internal and external environments". Enterprise Risk Management (ERM) encompasses the broad measures that are available for a company to manage adverse negative changes occurring in its business environment.

2.4   Advantages of ERM

According to Muslih (2019), effectively implemented enterprise risk management could have a positive impact on a firm's performance. Based on the quantitative research method implemented on research data consisting of information about publicly listed companies in Indonesia, the author identified the prevalence of a positive correlation between ERM and firm performance. Contrary, the author did not find research evidence supporting the notion of the positive impact of corporate governance on the ERM. Furthermore, Acharyya (2008) stated that even the implementation of simple risk management techniques such as balanced scorecards could have a positive contribution towards enhancing risk exposure among insurance companies. Moreover, the introduction of the balanced scorecard has positively contributed towards an enhanced economic value-added. Furthermore, Naik and Prasad (2021) highlighted the benefits of enterprise risk management practices such as enhanced cost-effectiveness, the stabilization of a firm's earnings, increased profit levels, enhanced decision-making, improved and effective risk communication, achievement of competitive advantage through effective resource allocation all of which contributed positively to a firm's value and value. The authors noted the necessity of ERM in countries with unstable macroeconomic and financial environments. ERM and Contingency planning around the world Risk management and contingency planning are two widely addressed topics in business management. Norman and Jansson (2004) analysed Ericsson's risk management strategies to mitigate the supply chain risks after a serious sub-supplier accident. The company had to address the risks arising from the failure of a sub-supplier in one of the major contracts of the company. As a result, it was found that the underestimation of the risks arising from the supply chains could result in devastating impacts as Ericsson failed to monitor and control the risks. Moreover, the authors such as Rigby and Bilodeau (2011), Coker and Mounier-Jack (2006), and Trzeciak and Rivers (2003) mostly focused on the social, health and environmental risk management in both developed and developing countries. Common social crises such as the spread of infectious diseases, environmental disasters and others were found to influence the well-being of the enterprises. Contrary, Wu and Olson (2009) examined the common risks of small businesses by focusing on European companies. According to the authors, the main risks for small businesses in the region included liquidity risk, high levels of competition and inadequate capital management practices. On the other hand, Ekwere (2016) studied enterprise risk management and contingency planning in the case of the l and medium enterprises (SMEs) in OECD countries. According to the author, SMEs are exposed to greater risks due to the firm size and constrained access to the capital for the further growth of the business. Moreover, the research results indicated that SMEs were more vulnerable to external risks than large multinational enterprises, which can be explained by the existence of well-developed enterprise risk management and contingency planning tactics among multinational enterprises. Moreover, Zhao et al., (2013) have conducted research work examining the success factors of enterprise risk management among Chinese companies. The research evidence suggests that the Chinese construction companies developed highly effective risk management practices, which was partially due to the industry requirements as well as regulations that were strict in the case of the Chinese construction and real estate market.

2.5   Conclusion

In conclusion, an analysis of existing academic literature on risk management has provided more detailed and insightful information about the types of risks (systematic vs. unsystematic), risk management approaches and frameworks,

risk management theory as well as the benefits of enterprise risk management (ERM). As noted from the analysis, constantly monitoring and mitigating enterprise risks is a more cost-effective strategy rather than dealing with the consequences of unmitigated risks. The literature review demonstrated the importance of ERM as an effective instrument of corporate governance that cannot be neglected. Therefore, risk and crisis management competency development should become one of the fundamental aspects of effective corporate governance. The literature review has demonstrated the differences in the approaches as well as the risk factors influencing organizational performance. The common finding was that the risk management and contingency planning practices were dictated by factors such as firm size as well as competition.

3 Research Methodology

3.1 Introduction

To achieve the research aims and objectives, it is necessary to develop an appropriate research methodology, which will be effective in collecting required and relevant research information. Hence, this section will outline the research method, its justification, potential advantages and disadvantages, sampling approach and potential ethical concerns. Moreover, the section will address research hypotheses, which are based on the information analysed in the "Literature review" section of the research.

3.2 Research Hypotheses

The current research project is focused on the evaluation of risk and crisis management practices in line with the contingency planning competencies in Kazakhstani companies. Based on the analysis of existing academic literature and the authors' research on the topic, the following research hypotheses were developed:

Hypothesis 0: Kazakhstani companies are equally exposed to internal as well as external contingencies affecting their overall performance.

Hypothesis 1: Kazakhstani companies possess adequate knowledge of enterprise risk management practices and utilize ineffective contingency planning.

Hypothesis 2: The nature and effectiveness of enterprise risk management as well as contingency planning competencies in Kazakhstani companies are dictated by firm-specific factors such as firm size, nature of operations and industry requirements. Overall, developed research hypotheses are focused on framing the research theory and enable authors to develop data collection strategies specifically designed to collect evidence supporting or neglecting the hypotheses.

3.3 Research Method

Taking into consideration the specifics of the research topic and its relevance to the specific group of prospective research respondents, it is decided to implement mixed research consisting of quantitative (surveying) and qualitative (interviewing) techniques. Administering quantitative research will be achieved through an online surveying tool, Google Forms. The selection of the mixed research methods will ensure research data reliability and viability based on which logical conclusions will be made.

However, it is necessary to address the potential benefits and shortcomings of the selected research method. Gunbayi (2020) stated that mixed research methods are commonly used by researchers since they provide more detailed and relevant research data on a research topic. On the other hand, Allwood (2012) argued that during the application of mixed research, the distinction between the qualitative and quantitative methods is problematic to identify. Nevertheless, Agerfalk (2013) highlighted data diversity as one of the significant advantages of implementing mixed research methods. Malina, Nottrkliy and Selto (2011) stated that the primary advantage of implementing mixed research methods is that a researcher can participate in the data collection process, especially in the case of qualitative research to ensure obtaining unbiased information. Overall, these primary advantages and disadvantages need to be considered in implementing the research since these factors can have a considerable impact on the data quality.

3.4 Sampling Technique

Given the specifics of the research topic, it is decided to apply a purposeful sampling technique, which was found as an effective sampling strategy. The purposeful sampling technique targets a specifically required sample population, which fits the research topic and objectives. Acharya et al., (2013) stated purposeful

sampling techniques enable a researcher to exclude irrelevant samples and specifically target the needed sample populations, which increases data reliability as well as quality. The primary characteristic of the purposeful sampling technique will be the company and industry that a research participant represents. In other words, the research work will be focused on several industries in Kazakhstan including transportation and logistics, airlines, banking and insurance, manufacturing companies as well as service companies. Hence, the analysis of these industries could provide insightful information about the nature and types of risks, different risk management approaches and procedures, risk management policies as well as contingency planning.

3.5   Data Collection

To collect quantitative research data, the surveys will be administered to the companies representing each industry mentioned previously. It is expected to collect a minimum of 80 responses from 5-7 companies representing the industries. The survey will consist of multiple choice, open-end and Likert scale questions aimed at analysing the risk perceptions, risk culture, internal policies, factors and types of risks that influence a firm.

Furthermore, online and offline interviews will be conducted with experts and specialists working in enterprise risk management or respondents with relevant work and educational backgrounds. Indeed, the interviews will be focused on the main challenges in implementing effective risk management practices, national characteristics of risk culture in Kazakhstani enterprises as well as potential mechanisms/ models in developing contingency planning and risk management competencies in companies. It is expected to collect at least 5-7 interviews.

Overall, surveys will be focused on the analysis of existing risk management practices, risk awareness, competencies, and types of risks and overall internal as well as external factors influencing the company's operational performance, while interviews will provide insightful information on the nature of risks faced by Kazakhstani companies, risk models and implementation among them.

3.6   Data   Analysis

Obtained research data will be analysed through the implementation of basic statistical measurements, and descriptive statistics as well as by comparing the responses with the information obtained from interviews. The information will be analysed using graphs as well as other measures to determine the degree of interrelationships between identified risk variables. Data analysis will combine both statistical and descriptive methods of analysis. By

3.7   Ethical Considerations

Ethical challenges tend to arise over the course of conducting research. Taking into account the application of a mixed research method consisting of surveying and interviewing, it is important to address potential ethical issues. First of all, the language barrier is one of the most common issues as both survey and interview respondents may not possess advanced levels of English. Hence, it could lead to the misinterpretation of the questions leading to data validity and reliability issues. Thus, it is decided to interpret the survey and interview questions in the Russian language to provide the respondents with a high level of understanding so that they could more objectively provide answers. Second and the most important ethical issue is related to the potential disclosure of personal information. To prevent the disclosure risk, it is decided to exclude personal information from surveys and all respondents will have to read and agree on the survey terms before proceeding to the questions. As for interviews, it is decided to ask for the permission of respondents for disclosure. In case of refusal, interviews will be assigned a unique code such as "Respondent 1, Respondent 2". Furthermore, to ensure data reliability, all working papers as well as responses will be provided in the "Appendix" section of the final draft.

4   Research Findings and Analysis

4.1   Introduction

This section of the diploma research project is dedicated to the analysis of the findings from the surveys and interviews conducted to obtain valuable information about crisis management initiatives and contingency planning practices. The findings of the research will be grouped into demographic findings, risk management and contingency planning practices and overall perceptions related to risk management practices. It is important to note that it was expected to obtain a minimum of 80 complete surveys from

at least five companies, which could provide more detailed information about the research topic and its relevance in analysed companies.

4.2 Demographic and General Findings

The current section is focused on the analysis of the demographic and general findings related to the research work. In total, five experts specializing in finance and accounting, internal audit and risk management were interviewed. Based on the confidentiality and anonymity concerns, the respondents' names were coded as "Interviewee 1, Interviewee 2, etc." Interviewees represent the following industries:

Table 1: Interviewees and relevant industries

Interviewee	Industry
Interviewee 1	Airlines
Interviewee 2	Banking and Finance
Interviewee 3	Manufacturing
Interviewee 4	Oil and Gas
Interviewee 5	Transportation and Logistics

As can be observed from Table 1, interviewees represent major industries of the Kazakhstani economy. Therefore, it is expected that the results of interviews will bring to light the crisis and risk management, as well as contingency planning efforts, present in these industries. Overall, it was expected to obtain at least 80 complete surveys. The total number of responses was equal to 74. The survey respondents' age structure looks as follows:
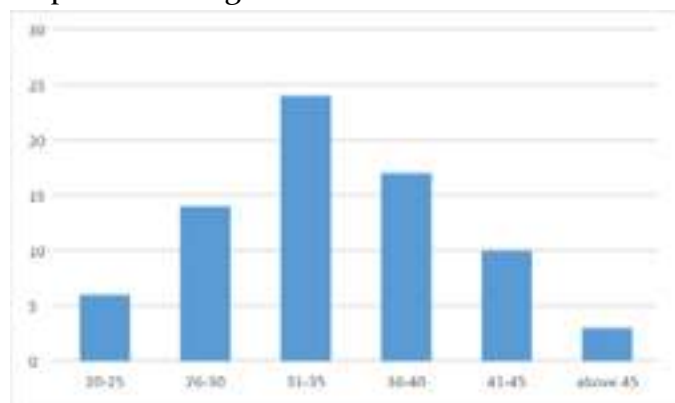
Figure 4: Age structure of the survey respondents (by Authors)

As can be observed from Figure 4, the majority of the respondents were aged 31-35 years. The average age of the respondents was equal to 35 years. However, it is necessary to mention that the second largest age group is 36-40 years. It is necessary to note that the interviewee's average age was equal to 33 years.

Out of 74 respondents, 35 were females and 39 respondents were males. In the case of the interview participants, the number of females was equal to 2, while males were 3. Furthermore, it was important to analyse the work experience of the respondents to have a better understanding of the awareness of the risk management, crisis and contingency planning activities within the organization. Therefore, the following Figure 5 summarizes information about the work experience levels of survey respondents:
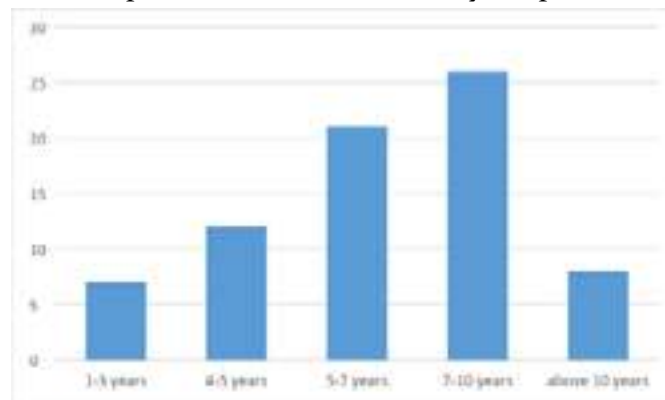
Figure 5: The work experience levels of survey respondents (by Authors)

Figure 5 shows that the majority of the survey respondents possessed work experience of 7-10 years, which is considered an important research finding. It was assumed that the more the work experience, the more a survey respondent knew the research subject. Therefore, it is logical to conclude that the average work experience of the survey population ranged between 6 and 10 years. On the other hand, interviewees' average work experience in their respective companies was equal to 5.5 years.

Next, the survey participants were asked to indicate the department/function they worked for. The functional/departmental differences would also provide insightful information about risk perception and mitigation practices in organizations. Thus, the following Figure 6 represents information about the main functions for which survey respondents work:
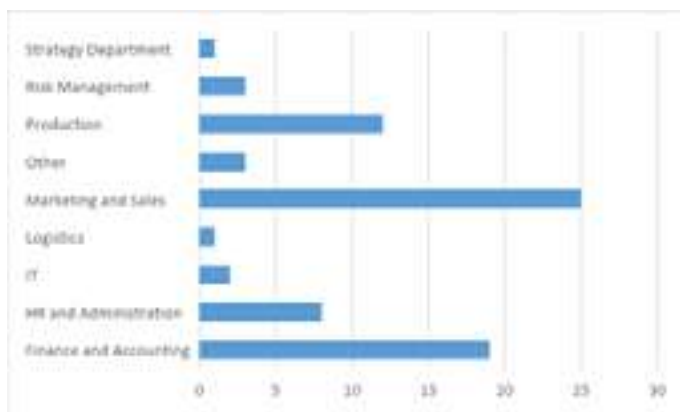
Figure 6: Departmental relevance of the survey respondents (by Authors)
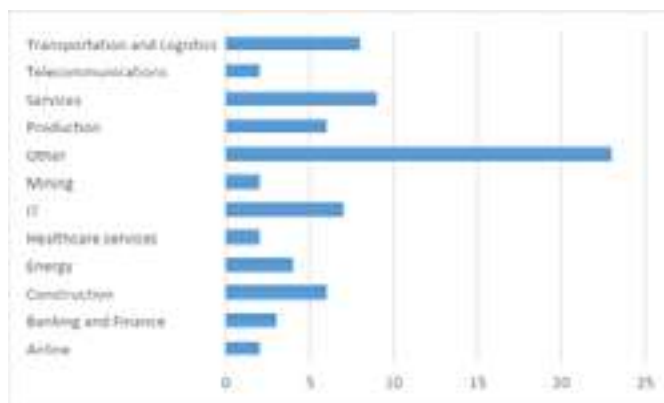

Figure 7: Industry relevance of the survey respondents (by Authors)

As noted from the figure above, the majority of the survey respondents represented "Marketing and Sales" (25) followed by "Finance and Accounting" (19) and "Production" (12). Interestingly, only 3 survey respondents were from the "Risk Management" Department. Similarly, 3 interviewees were from the "Finance and Accounting" and 2 represented the "Risk Management" Department. Therefore, it is assumed that the representatives of finance, accounting and risk management functions could have a better understanding of the risks related to finance and economic changes, while other functions could have better knowledge of the risks from the company operations. Overall, the demographic and general findings demonstrated that the sample population was representative and included strong evidence such as work experience levels and different business functions, which contribute to research data quality.

4.3   Company and Industry Findings

To analyse the degree of representativeness of the sample population, the survey participants were asked to indicate the current company they work for. The obtained information was then structured, and the industry relevance was assigned. Hence, the following Figure 7 represents information about the industries that participated in the surveys:

It is noted that the "Other" category was the largest and included small companies such as retailers, resellers, providers of healthcare services, agricultural farms, clothing, hotels and others. Moreover, the most represented industry in the survey was "Services" (9) followed by "Transportation and Logistics" (8) and "Construction" (6) and "Production" (6). Indeed, the variability of the operational risks could be present in each industry, which was the main motivation to determine the industry being represented in the surveying process.

Based on the assumption a firm size could be another factor influencing the risk exposure apart from the industrial characteristics, survey participants were asked to indicate the size of their organizations. The following pie chart summarizes key findings:
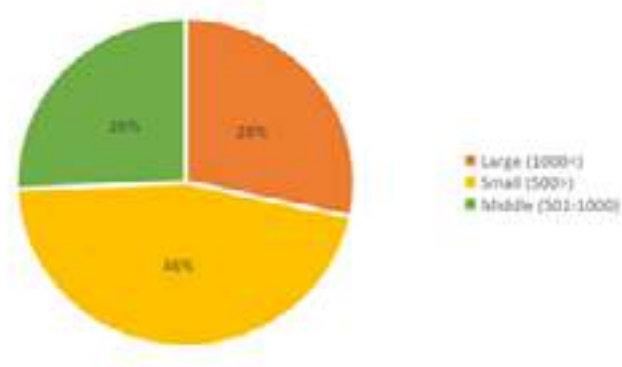

Figure 8: A firm size (by Authors)

Based on the observations, it can be concluded that the majority of firms participating in the survey fell under the category of "Small" (46%) with less than 500 employees. Notably, large companies made up the second group with 28% being followed by medium-sized companies representing 26% of the total sample population. Moreover, the analysis

of operations scope was another key factor that would bring to light the levels of risk exposure of an organization. Therefore, the survey participants were asked to determine the scope of operations of their respective companies. The main findings suggested that 81% of the organizations included in the sample population operate only in the Kazakhstani market, while 17.5% of surveyed organizations operate in post-Soviet country markets. Next, the survey participants were asked to determine key external factors influencing their enterprises. They were asked to indicate up to three main factors, which they considered as the most influential. The main findings are summarized in the following Figure 9:
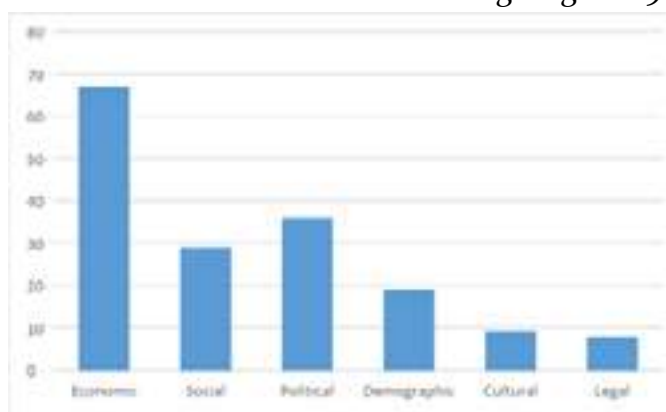
Figure 9: Main external factors influencing on company operations (by Authors)

As can be seen from the figure above, the most rated external factor was the economic factor. Therefore, it can be concluded that the majority of the companies in Kazakhstan are exposed to the risks arising from the economic environment in the country. The second considered factor was the political factors influencing company operations. Indeed, the interview participants were asked about the main external risks influencing their company operations. Interviewee 1 stated that political factors were the main source of risk in the airline industry: "Airline industry to a large extent depends on political factors. Based on the experience of our company, it can be stated that being a national flag carrier means that our company depends on the political decisions related to strengthening international cooperation with other countries, easing visa regimes and others influence the development of the international routes, entrance of other airlines in Kazakhstan

aviation industry. Indeed, air communication with another country is an important aspect of Kazakhstan's foreign policy. On the other hand, the economic crisis in Sri Lanka, and ongoing tensions between Russia and Ukraine in 2022 forced our company to shut down its operations in these countries leading to decreases in our revenues in these markets" says Interviewee 1. Moreover, Interviewee 2 stated that the main source of the risk for the company was economic factors such as inflation rates, key interest rate changes and the devaluation of the national currency. However, it was noted that political factors have also imposed additional challenges. It was reported that the imposition of economic sanctions on Russia and the closure of Russian commercial banks were key challenges for the banks as additional control mechanisms were introduced to control financial transactions between Kazakhstani and Russian banks. Interviewee 3 considered the following factors as imposing additional risks on his company: "Manufacturing industry has not completely recovered from the consequences of the COVID-19 pandemic that negatively influenced the supply chains and imports of the required raw materials Ongoing COVID-19 restrictions in China as well as Russian-Ukrainian military conflict had significantly influenced the transportation and raw material costs. Our company has experienced temporary issues in receiving ordered purchases from Russia and China, which led to rescheduling the manufacturing plan. As a result, it influenced the availability of our products to our customers" Interviewee 4 considered as key factors influencing the company and industry the situation in Ukraine that triggered economic sanctions and significantly limited transportation of oil and gas products. Moreover, imposed economic sanctions negatively influenced the economic relationships with Russia, which is considered a main transit country for Kazakhstani oil and gas products. Interviewee 5 considered political factors as a main source of risks for the company. COVID-19 had led to the re-consideration of transportation routes. The situation around Russia and Ukraine did not have much influence, but it contributed towards the limitations of transportation due to the economic sanctions constraining the financial transactions between Russia and Kazakhstan.

4.4 Risk Management, Contingency Planning and Perceptions

To examine the degree of risk awareness and risk perceptions, survey respondents were asked to report about the risk management practices, communication and training initiatives. To assess risk management practices among companies, Likert-scale questions were implemented during the online surveying process. To examine the effectiveness of the risk management and contingency planning, the survey respondents were asked to evaluate the statements about risk identification, monitoring, control and planning. The results of the analysis are demonstrated in the following Figure 10. It is important to note that Likert-scale responses were transformed into weighted average responses by using MEAN formula to derive average rates:
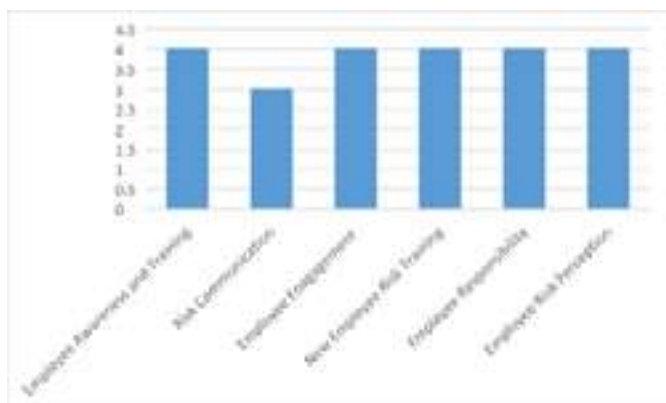
Figure 10: Assessment of risk management practices by employees (by Authors)

Figure 10 represents information about an employee's assessment of risk management practices in their respective organizations. The survey respondents were asked to rate each activity based on a 1-5 scale, where "1" means "strongly agree" and "5" means "strongly disagree". The averaged results of the survey responses found that employee awareness and training, employee engagement in risk management practices, training of new employees about potential risks, employee responsibility in risk management and employee risk perception levels were weak in selected companies. On the other hand, the risk communication practices received a more neutral response with a score of "3". Hence, it leads to the conclusion that risk management practices and initiatives among the Kazakhstani companies were weak. The majority of survey respondents indicated low levels of engagement,

and a clear understanding of required actions, instructions and roles in mitigating the potential risks. Thus, it leads to a conclusion that the risk management practices in observed organizations lacked the systematic approach so that the organizational level actions would be taken. As a result, the risk management practices and initiatives cast doubt on being effective.

Moreover, interviewees were also asked if their companies possessed a systematic approach to risk identification, evaluation, mitigation and control. Interviewee 1 stated the following regarding the risk management practices in their organisation: "Risk and crisis management is crucial as it is dictated by both the legal and industrial requirements. Therefore, ensuring minimized influence of the risks is one of the key aspects of the airline's strategy. Thus, the risk is constantly monitored, assessed and managed at different levels. The company has the Risk Management Function, Internal Audit services and Corporate Compliance departments that are engaged in risk management practices. Moreover, the company is committed towards the development and promotion of a risk-averse culture. More importantly, we consider the operational risks to be controlled and managed to prevent any accidents."

Interviewee 2 stated that the majority of the risk management practices in the company are managed by the Risk Management and Compliance Department. Moreover, it was found that the nature of the operational risks was different from other types of companies and industries. The common risks were related to personal data security, financial risks, liquidity risks and credit risks. Hence, it leads to the conclusion that industry specifics and company operations tend to influence the nature and source of risks as well as the risk mitigation approaches.

"Before COVID-19 pandemic, no special attention was given to the risk management activities in our company. More importantly, the importance of risk management practices was limited to the accident prevention at the workplace, which was a legal requirement for any manufacturing company. However, the pandemic and following geopolitical turbulence caused by the military conflict between Russia and Ukraine demonstrated that we needed to develop and address risk management practices as our company entered a turbulent period where

things change quite fast. Now, the company started risk management process integration that was initiated by the top management. Therefore, I can conclude that the systematic approach in risk management is under the development process in our company" says Interviewee 4.

Moreover, Interviewees 4 and 5 stated that risk management was considered as something abstract for their companies. The changing business environment pushed their companies to analyse, classify and mitigate the potential negative consequences of the risks. They admitted that even though the management actions to address the risks may not fully hedge their companies, they were focused on reducing the risks. Furthermore, the survey intended to analyse the effectiveness of the risk management practices present in surveyed organizations. The key findings are demonstrated in the following Figure 11:
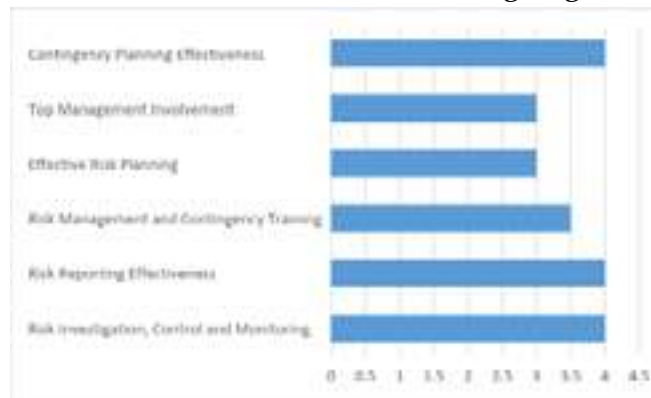
Figure 11: Risk Management and Contingency Planning Effectiveness (by Authors)

Based on the 1-5 scoring system, it was found that the risk management and contingency planning effectiveness of the surveyed companies was relatively weak in line with the risk reporting effectiveness as well as risk investigation, control and monitoring. Figure 11 shows that the opinion about risk management and contingency planning was split among the survey participants. Other relevant activities such as effective risk planning and top management involvement received more neutrally positive scores. Surprisingly, the survey findings related to the risk management, contingency planning initiatives show that the effectiveness level of such activities in organizations was considerably weak. Furthermore, the interview participants were asked to evaluate the effectiveness of the risk, crisis management and contingency planning practices in their companies. The

interview results demonstrate similar findings. For instance, three out of five interviewees reported that these activities were ineffective. To obtain more detailed information explaining the ineffectiveness of the risk management and contingency planning practices, interviewees were asked to outline the main challenges and issues related to ensuring the effective implementation of such practices or increasing the effectiveness of existing relevant practices. "Even though I consider my company's risk management and contingency planning to be effective, I believe that supporting functional units lack an in-depth understanding of the risk-management practices, especially among the engineering and maintenance staff. Moreover, the office workers operating in different stations tend to lack an overall understanding of how their behaviour and decisions influence the operational risks of the company due to constant and effective communication" says Interviewee 1.

Furthermore, Interviewee 2 stated that the risk management and contingency planning practices in the organization were quite effective:

"As our company was able to overcome the challenges imposed by the pandemic, risk management and contingency planning have gained special attention by the top management. I consider several factors that contributed towards effectiveness of the risk management and contingency planning. Firstly, when a crisis occurred the top management reacted quickly and decisively to minimize the negative consequences. Secondly, our IT and Information Systems provided quick solutions to maintain labour productivity. Indeed, without IT support I barely imagine how the entire company could survive and maintain the operations. Thirdly, the company already had established risk management and contingency planning practices that collected information about the risks and communicated approaches of risk minimization"

On the other hand, Interviewee 3 highlighted the factors as well as challenges in ensuring the effectiveness of the risk management and contingency planning efforts. It was found that the lack of clearly designed processes and procedures, ineffective roles and responsibility delegation, and lack of effective communication approaches in line with the low degree of the top management's support contributed towards the ineffectiveness of the procedures.

Moreover, Interviewee 4 reported that ineffectiveness of the risk management and contingency planning competencies was related to the lack of special functions such as Risk Management function as well as risk management expertise in the organization. However, the pandemic of COVID-19 has had a significant influence on the need for systematic approaches to the crisis and risk management to ensure a high level of organizational productivity. Interestingly, Interviewee 4 noted that the main problem related to these initiatives was also a wrong perception of the employees that a particular risk will not influence them at all.

In addition, interview participants were asked to outline the main firm-level factors that contribute towards the riskiness of their companies. The firm-specific factors that were found to influence a firm risk included firm size, industrial characteristics, the existence of risk management and contingency planning practices, organizational culture, the effectiveness of top management's corporate governance, and the nature of operations. Indeed, these factors could provide information about the main determinants of firm-specific risks that are within the control of a company and can be mitigated.

Based on the extensive and detailed analysis of interview and survey findings, it can be concluded that the research Hypothesis 1 is rejected. On the other hand, the findings supported the research Hypothesis 2, which was accepted.

Last but yet importantly, interview participants were asked to provide practical recommendations related to enhancing and developing risk management and contingency planning competences. Based on the interview findings, the development of the competencies related to risk management and contingency planning requires the following

1.   Changes in the organizational culture through focusing on the development of a risk-aware culture that is expected to influence all aspects of the organizational performance. Changes on the organizational level will have a considerable impact on the risk perception of the employees and would nurture risk-aware behaviour (Interviewee 1).

2.   It is recommended to develop more effective organizational communication systems that would improve risk identification, reporting, monitoring and mitigation. Effective organizational communication should be in two directions: from top to the bottom and from the bottom to the top (Interviewee 2). Effective communication will ensure taking required preventive measures that will ensure the minimized impact of the risks. Moreover, it will ensure more effective and fast information exchange required for decision making.

3.   Moreover, it is recommended to establish key functions such as internal audit and compliance and risk management (Interviewee 3). The development of such functions will positively influence the development of risk management and contingency planning knowledge generation and dissemination. A company must ensure unbiased and objective risk management practices where employees will be able to share their risk-based concerns with the functions that will be able to address the risks and communicate them to the top management. Given the high level of independence assigned to aforementioned functions in reporting the risk concerns, a company will achieve more desired outcomes.

4.   In addition, it is also recommended to develop the information systems such as HR, human resources, ERP and overall management systems to include risk management and contingency planning as an integral function (Interviewee 4). The development and integration of the management and contingency planning practices within the framework of the information system will ensure systematic nature of the relevant activities.

5.   Last but important, the company aiming at developing risk management and contingency planning practices should develop appropriate training and learning programs (Interviewee 5). The development of such programs will enable top management's expectations on risk management and contingency planning. Moreover, it will increase employee engagement and involvement in risk management practices.

Overall, the research findings and analysis section has provided insightful information about the current state of risk/crisis management and contingency planning activities present in the organizations that participated in the research work.

5   Conclusion

In conclusion, the current diploma research work intended to examine the current state of risk/crisis management and contingency planning practices in Kazakhstani companies, main internal and external factors influencing the risk levels, main problems related to the development of the risk-aware and risk-averse corporate culture in enterprises. Based on the observations and analysis of the existing academic literature review, the following research hypotheses were developed:

Hypothesis 1: Kazakhstani companies possess adequate knowledge of enterprise risk management practices and utilize ineffective contingency planning.

Hypothesis 2: The nature and effectiveness of enterprise risk management as well as contingency planning competencies in Kazakhstani companies are dictated by firm-specific factors such as firm size, nature of operations and industry requirements.

To test these research hypotheses, the mixed research methodology was implemented by relying on quantitative (online surveying) and qualitative (interviews) data collection techniques. Overall, 74 complete survey responses and five interviews were collected. The research findings demonstrated that implementation of the crisis/risk management and contingency planning practices have gained considerable attention by the companies in recent years, which was mainly dictated by the political, social and economic factors. Nonetheless, the research evidence did not support hypothesis 1, which was rejected. Based on the survey findings conducted among company employees found low levels of effectiveness in risk management and contingency planning practices. Namely, it was found that risk reporting effectiveness as well as risk investigation, control and monitoring were weak. Also, employee risk awareness and training, employee engagement in risk management practices, training of new employees about potential risks, employee responsibility in risk management and employee risk perception levels were weak in selected companies. Moreover, it was found that the main risk factor for Kazakhstani companies was economic factors. On the other hand, the research findings supported hypothesis 2. Specifically, interview findings demonstrated that risk management and contingency planning practices were influenced by firm-specific and industry-specific factors. Based on the results of the research several recommendations have been made to develop required competencies in achieving effective risk management and contingency planning practices. Overall, the research results have demonstrated the country-specific variances in comparison with the works analysed in the "Literature Review" section, where ERM and contingency planning practices were analysed among OECD countries, European companies and Chinese ones.

Potential Limitations

During the research, several potential limitations have been identified. Addressing the research limitations could provide future research works with practical information.

Firstly, the survey sample population was limited to 74 responses, which significantly limits the ability of the author to generalize research findings to the large sample population. Therefore, future research on risk management should consider the extension of survey populations.

Secondly, the application of the mixed methods based on using qualitative and quantitative methods requires additional testing to ensure their match with the research subject. Hence, it is recommended to implement other qualitative research to gain qualitative information about risk management practices.

Thirdly, the potential limitation of the current research work can be the fact that it did not specifically analyse a few industries, but attempted to address the risk management practices and contingency planning activities in general among diverse companies. While such practice could be effective in obtaining overall information about the research topic, it is limited to addressing industry-specific variations that have to be considered in examining the risk management and contingency planning activities.

6   References

1.   Acharya, A. S., Prakash, A., Saxena, P., & Nigam, A. (2013). Sampling: Why and how of it. Indian Journal of Medical Specialties, 4(2), 330-333.

2.   Acharyya, M. (2008). In measuring the benefits of enterprise risk management in insurance: An integration of economic value added and balanced scorecard approaches. ERM Monograph, 1-25.

3.   Ågerfalk, P. J. (2013). Embracing diversity

through mixed methods research. European Journal of Information Systems, 22(3), 251-256.

4. Allwood, C. M. (2012). The distinction between qualitative and quantitative research methods is problematic. Quality & Quantity, 46, 1417-1429.

5. Aven, T. (2016). Risk assessment and risk management: Review of recent advances on their foundation. European Journal of Operational Research, 253(1), 1-13.

6. Chen, J. (2023, February 22). What is unsystematic risk? types and measurements explained. Investopedia. Retrieved April 15, 2023, from https://www.investopedia.com/terms/u/unsystematicrisk.asp

7. Chen, J. (2023, March 25). Systematic risk: Definition and examples. Investopedia. Retrieved April 15, 2023, from https://www.investopedia.com/terms/s/systematicrisk.asp

8. Chen, X., Chong, W. F., Feng, R., & Zhang, L. (2021). Pandemic risk management: resources contingency planning and allocation. Insurance: Mathematics and Economics, 101, 359-383.

9. Clifford, W., & Smith, J. (1995). Corporate risk management: theory and practice. The Journal of derivates, 30, 21-31.

10. Coker, R., & Mounier-Jack, S. (2006). Pandemic influenza preparedness in the Asia–Pacific region. The Lancet, 368(9538), 886-889.

11. Corporate Finance Institute. (2022, December 5). Market value of debt. Corporate Finance Institute. Retrieved April 15, 2023, from https://corporatefinanceinstitute.com/resources/fixed-income/market-value-of-debt/

12. Dionne, G. (2013). Risk management: History, definition, and critique. Risk management and insurance review, 16(2), 147-166.

13. Ekwere, N. (2016). Framework of effective risk management in small and medium enterprises (SMESs): a literature review. Bina Ekonomi, 20(1), 23-46.

14. Gunbayi, I. (2020). Action research as mixed methods research: Definition, philosophy, types, process, political and ethical issues and pros and cons. Journal of Mixed Methods Studies, (2).

15. Jaworek, M., Karaszewski, W., & Kuczmarska, M. (2022). Risk perception in practice of Polish MNCs in Kazakhstan during COVID-19 time. Ekonomia i Prawo. Economics and Law, 21(3), 583-601.

16. Johnson, J. G., & Busemeyer, J. R. (2010). Decision making under risk and uncertainty. Wiley Interdisciplinary Reviews: Cognitive Science, 1(5), 736-749.

17. Lai, F. W., & A Samad, F. (2010). Enterprise risk management framework and the empirical determinants of its implementation.

18. Lamine, E., Thabet, R., Sienou, A., Bork, D., Fontanili, F., & Pingaud, H. (2020). BPRIM: An integrated framework for business process management and risk management. Computers in Industry, 117, 103199.

19. Malina, M. A., Nørreklit, H. S., & Selto, F. H. (2011). Lessons learned: advantages and disadvantages of mixed method research. Qualitative Research in Accounting & Management, 8(1), 59-71.

20. Mami, E, and Kenzheali, A., (2022). What is the economic impact of the war in Ukraine on Kazakhstan? Retrieved March 7, 2023, from https://odi.org/en/insights/what-is-the-economic-impact-of-the-war-in-ukraine-on-kazakhstan/

21. Mikes, A., & Kaplan, R. S. (2014, October). Towards a contingency theory of enterprise risk management. AAA.

22. Muslih, M. (2019). The benefit of enterprise risk management (ERM) on firm performance. Indonesian Management and Accounting Research, 17(2), 168-185.

23. Naik, S., & Prasad, C. V. (2021). Benefits of enterprise risk management: A systematic review of literature. Reference to this paper should be made as follows: Naik, S, 28-35.

24. Norrman, A., & Jansson, U. (2004). Ericsson's proactive supply chain risk management approach after a serious sub-supplier accident. International journal of physical distribution & logistics management.

25. Ozdemir, B. (2018). Evolution of risk management from risk compliance to strategic risk management: From Basel I to Basel II, III and IFRS 9. Journal of Risk Management in Financial Institutions, 11(1), 76-85.

26. Park, K. F., & Shapira, Z. (2017). Risk and uncertainty. The palgrave encyclopedia of strategic management.

27. Popchev, I., Radeva, I., & Nikolova, I. (2021). Aspects of the evolution from risk

management to enterprise global risk management. Engineering sciences: journal of science department engineering sciences at the Bulgarian academy of sciences, (1), 16-30.

28. Rigby, D., & Bilodeau, B. (2011). Management tools & trends 2015. London: Bain & Company.

29. Sukrianingrum, D. R., & Manda, G. S. (2020). The effect of systematic risk and unsystematic risk on expected return of optimal portfolio. SAR (Soedirman Accounting Review): Journal of Accounting and Business, 5(2), 181-195.

30. Themsen, T. N., & Skærbæk, P. (2018). The performativity of risk management frameworks and technologies: The translation of uncertainties into pure and impure risks. Accounting, Organizations and Society, 67, 20-33.

31. Trzeciak, S., & Rivers, E. P. (2003). Emergency department overcrowding in the United States: an emerging threat to patient safety and public health. Emergency medicine journal, 20(5), 402-405.

32. Wu, D. D., & Olson, D. L. (2009). Enterprise risk management: small business scorecard analysis. Production Planning and Control, 20(4), 362-369.

33. Zhao, X., Hwang, B. G., & Low, S. P. (2013). Critical success factors for enterprise risk management in Chinese construction companies. Construction Management and Economics, 31(12), 1199-1214.

Development and Creation of an Information Site With a Registration of Applications for Entry Into Student Organizations of the of M. Narikbayev KAZGUU University.

Assel Muratova, Tomiris Orymbayeva, Nazerke Tanirbergen, Dilyara Tulubayeva

Abstract

Work was conducted to create a website to automatically fill out applications for membership in student organizations of the university, as well as to inform potential participants about various extracurricular clubs to raise awareness among students.

The topic of this work was chosen and completed in connection with the urgent problem of the lack of a single application for student organizations. With a ready-made website, KAZGUU students can quickly and efficiently consider various options for joining the club, as well as learn additional information about the organizations themselves and their events.

The diploma project was developed taking into account the use of such website creation tools as HTML, CSS, PHP, and MySQL. Next, the structure of the website and the connection of the given hosting and domain were determined.

As a result, a website was created through which students of KAZGUU and future potential universities can freely apply for consideration to join student organizations, be informed about extracurricular activities, and actively monitor current and future student club events.

This work will be useful to universities that do not have a clear and unified system for monitoring student organizations and their flow of student applicants. In addition, the user can keep an eye on upcoming student club events for their potential participation.

Introduction

Information technologies today play a big role in the life of a modern person. The use of technology has entered the routine of mankind in various fields, helping to simplify the work and reduce the time for its execution. The IT sphere provides many different products, for example, mobile applications, websites, and portals, chatbots, big data analysis, etc. All these products make a great contribution to the process of informatization of people. Informatization exists due to the development of information technologies and the Internet. With the advent of the Internet, users go online every day, especially using the services of browsers with a large number of websites to choose from. Obtaining any necessary information involves the process of searching the Internet on web platforms. With the help of websites, it is currently possible to provide and distribute information to the maximum number of people around the world most easily and conveniently (Sandeep & Singh, 2017).

Web pages have become relevant in government and educational affairs. With e-government, citizens can receive interesting and relevant information, certificates, and documents from state-owned enterprises online. An example of such a portal is eGov, where the work of the authorities is conducted in the most accessible way for citizens. The field of education is rapidly developing with the advent of the era of digitalization and informatization. Educational institutions, for example, such as universities, colleges, and schools can present themselves on the Internet. All the necessary information about education will be available on the website, where anyone can get the necessary information. Educational platforms offer students the opportunity to receive important news using the mailing method, exchange opinions and create networking, facilitate interaction between students and teaching staff, and learn up-to-date information about various events and events at the university.

At KAZGUU University, first-year students must complete the CSI program, for which students join various organizations. However, there are a lot of students, and each association conducts various interviews and selections since to apply, students need to come to the fair organized by the organizations or write to them on social networks. However, this entire application process can take a long time as not all students attend these types of events as they may be busy or have other reasons. Furthermore, there are a lot of organizations so it can be a little complicated to notice announcements about each organization among other various news. Therefore, an idea was developed to create a website to facilitate

and improve the work of organizations in KAZGUU. On this site, currently, relevant organizations can post their information, and students can apply and subsequently go through castings, etc. The main idea of this project is to help students and organizations save their time and make their work more productive. Creating a separate website for student organizations will help to manage all the information so that students are aware of all the news of associations and distinguish this information from various other news that the university posts. Therefore, the goal of this project is to facilitate the task not only for student organizations but also for the students themselves. The website will have several functions for the organization and the students themselves, organizations will be able to add and remove information on the site, and students will be able to apply online through the website, which will take less time. In addition, surveys will be conducted to ask the students themselves about the features they would like to see on the website so further results will be improved. Methods will also be used in the form of interviews with DSA chairs and university students to fully analyse the identification of problems and the relevance of the idea of this project. Moreover, various sources and comparisons will be considered to achieve the best results.

Literature Review

For some students, the university is not only a place of higher education but also a place where people with the same passions get the opportunity to organize and/or join student organizations with similar interests. So, at the KAZGUU University at the moment there are about 30 student organizations, which are additional activities in the educational program of students.

The research (Borges, Ferreira, de Oliveira, Macini & Caldana, 2017) identified spontaneous student practice of initiatives such as the Principles for Responsible Management Education (PRME) while participating in clubs. According to this, students who are members of any organizations have shown a predisposition to developing social skills, including "responsibility, ethics, interest in sustainability and awareness of society" (Borges, Ferreira, de Oliveira, Macini & Caldana, 2017, p. 153).

Following this judgment, according to Vasilj, Skender and Horvat (2021), student organizations are a good foundation for laying soft skills and networking among students. In addition to the fact that such skills will be useful not only for developing a successful career by improving existing skills but also for "building long-term personal, social and business connections" (Vasilj, Skender & Horvat, 2021, p. 1934). Students gain valuable experience and knowledge through the prism of participation in the activities of clubs: from organizing events to participating in a variety of university activities. Such associations help students to get acquainted with some professions already during their educational activities, which in the future will help students develop faster and more actively in their future careers. When hiring an employee, employers look for analytical skills, including critical thinking (Sobolevskaya, 2019). So, one of the important results when graduating from university is the development of the ability to correctly perceive information, which is achieved both during educational activities and with participation in student associations (Sobolevskaya, 2019). Greater involvement in extracurricular projects directly affects the level of critical thinking, from which it turns out that students receive such benefits as increased involvement in the university and satisfaction with student life, development of team skills and communication skills, responsibility, and leadership. Macrini (2012) draws attention to the problem in which organizations with a large number of internal sub-organizations face the difficulty of communicating using traditional means of information, as a result of which there is a need to create a single platform for the development of communication within the organization. Thus, such a platform further helps to automatically extract the necessary information, overcome fragmentation in sub-organizations and actively use human talent (Macrini, 2012). In this research, student organizations of KAZGUU were taken as a basis, information about which will later be used to create a single web platform where students can apply to join student clubs, and participants themselves to follow the news and events held by organizations

In addition to the fact that students receive a large number of bonuses while participating in student clubs, there is also a downside in the form of a constant variability in the composition

of the association due to the release of previous members from the university. So, in addition to the fact that there are difficulties in the form of liquidity of the organization, careful planning, and fundraising, due to changes in the composition of the project organizers and heads of organizations, a new problem appears in the form of the transfer of accumulated experience (Vasilj, Skender & Horvat, 2021). Given the short mandate, it becomes difficult to transfer experience and knowledge from previous participants to current ones every time. Thus, Vasilj, Skender and Horvat showed that the presence of an intelligent digital platform helped to solve the problems described above (2021). Having a model that contains public information about student organizations helps to increase new members' awareness of news and changes in clubs.

Karani, A., Thanki, H., & Achuthan, S. (2021) stated in the article the impact of university website on Students, a study was conducted on the use of the organization's website to test and determine the level of usability of the platform. The study was conducted from a student perspective, where a total of 577 students completed a website quality questionnaire. As a result, it was revealed that the web platform met the criteria of students in terms of content, organization, and readability, which in turn had a large part of the impact on platform satisfaction. In addition, this study showed the importance of maintaining the university's website to keep students comfortable and up to date with content.

In the article, it might be observed that the results of 243 studies conducted and published over a period of 19 years indicate the relationship between student engagement and technology (Bond et al, 2020). As a result of the collected information on the conducted research, the main points of the research were identified, the results of which were the behavioural involvement of students through the use of technology. This article allows it to become the basis for further research regarding the study of the issue of stimulating student participation through the use of information technology.

Moreover, as a result of research conducted on Austrian and Chinese websites, showed a direct influence on culture and satisfaction with the use of websites (Alexander et al, 2021). Compliance with user needs plays a significant role in the success of the resulting use of websites. Consequently, the introduction of cultural elements along the way of creation has an impact on the satisfaction of website users. For that reason, it is essential to understand the role of input from different styles of providing information and also the interaction that the user seeks. The paper showed how students rate the effectiveness and satisfaction of university websites designed for students as a way to learn (Shehzadi, S. et al, 2021). As one of the main methodologies, surveys were used, in which about 408 students from private and public universities in Pakistan took part. In addition, the data obtained from the electronic questionnaires were verified using the PLS-SEM analysis. All work leads to the conclusion that key factors such as ease of use and usefulness of the website are the basis for a positive outcome in favour of student learning.

The study reveals how students perceive e-learning in India due to the dynamic growth of Internet technologies(Chopra, G. et al, 2019). The survey method was used for students using courses from the Coursera website, the survey involved questions regarding the e-learning system, as well as the effectiveness of using the website. The result of the work was that quality plays a significant role in the evaluation of the website, where the quality of the information does not affect the same level of the quality of the system and service.

Methodology

To analyse more deeply the relevance of the topic of this project, a participatory methodological approach was used during the formation of the process. This helped us to identify and assess the real problems of club members and representatives of the Department of Student Organizations in organizing the acceptance of applications and the activity of students planning to join one of the clubs.

Two methods were identified to obtain a deeper and more complete understanding of the situation and analysis of this project topic in university conditions. One of the methods is to conduct a survey in an online format using a platform such as Google Forms. The survey was conducted in a confessional manner to avoid distorting the dates given the activities of the respondents. This survey includes 9 questions that are aimed at clarifying the main problems of participants and/or leaders of student organizations during

the acceptance of applications for participation in the same clubs. In addition, such questions were created to generally find out the benefits that students receive while participating in student organizations. This kind of information will be used to identify a general trend in the acquisition/development of any skills among the participants of student clubs. The information was collected in the form of an online survey, which was sent out via WhatsApp messenger, after which the data was organized in the form of charts (pie charts). Thus, the information was processed in visual form for a deep understanding of the questions asked, after which an analysis of the answers was carried out to identify the need to create such a product as a single website for KAZGUU student organizations.

The second method of obtaining dates was developed and used in the form of interviews with representatives of the DSA (Department of Student Associations). The relevance of this method is the consideration of the creation of such a site for student organizations by the main representatives of the department. Thus, actual problems of the organizational structure will be identified, in particular at the stage of filing, consideration and entering into statistics the number of incoming applications. For the interview, 6 questions were used, which were designed to identify the main problems in application automation and the relevance of having such a site for further use at the university. In particular, such issues were noted as how the department copes with the receipt of applications to student organizations, in what form these applications are considered, the organizational structure when accepting applications and tracking them, how the statistics of incoming participants in student clubs are formed, what are the main problems that arise when considering applications and whether there is a need to create a website with single information about all student organizations and automated submission of applications.

In addition, a corridor method was used, during which a live survey of the representatives of student organizations in KAZGUU was conducted. To consider the relevance of the problem, questions were asked about the methods of providing information about clubs and events and their effectiveness, the advantages of creating a single site for all student organizations and how useful this site will be in the realities of promoting university events, attracting new club members and organizing and simplifying the processing of requests for the entry. Thus, the relevance of the problem was considered in terms of an online survey from university students, as well as interviews with heads of departments and leaders of student organizations.

Analysis and Results

Description of the IT product developed and its features

The IT product includes the creation of a website for students of KAZGUU University, where an online application system for joining student organizations was developed, as well as general information about university clubs and additional articles from representatives of the organization to disseminate up-to-date information. The main goal of the product is the automation of filing applications and increasing awareness among students of KAZGUU University. The creation of such an IT product will increase productivity, save time for both students and the department, and raise awareness among students about current student organizations.

The product itself is a website with such major functions as collecting applications and posting. Online application is designed to automate the process of applying to join a selected student organization. Thus, students will be able to apply to clubs of interest on a single site, and representatives of the organizations will be able to process these applications in a convenient format. In addition, the postings feature from organizations and the department itself will help solidify understanding of the product as part of the university's information system. This leads to the fact that this IT product will be the basis for news about KAZGUU student organizations.

It is also worth mentioning features such as the main page with news and search engine. It will allow us not only to view the main moments of the life of student organizations but also to search for necessary information by entering keywords. Additional information in the form of answers to questions has also been added to the site to make it easier to find answers to your questions.

On the side of the administrative page, an administrator control panel has been added. Its main functions are:
1. adding users as representatives of student organizations to further post news articles.

2. adding posts with the club's name, topic, and post description.
3.addingaclubwithitsnameandabriefdescription.
4. managing users to change access parameters.
5. club management, where you can change the name and delete organizations.
6. management of posts for correcting the articles themselves and deleting them.
User requirements and feedback
Analysing the results of the above research methods, the need for a unified website where students can apply to join a student club, as well as view all the information activities of the organizations was identified. A total of 105 students were surveyed (Figure 1.1), whose responses helped to understand the urgency of the problem of this project and the need for a unified website for student organizations.
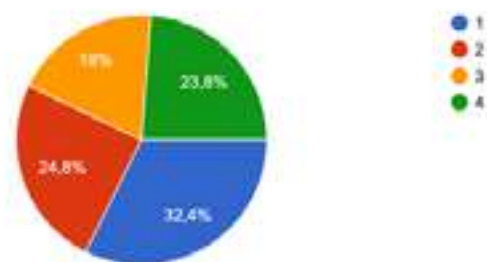
Figure 1.1 Online Survey

Based on the results of the survey, the main problem in submitting applications was the uncertainty of where the answer to joining the organization would come from (Figure 1.2) and how quickly it would be possible to find out the answer. In addition, the issue was raised that when applications were collected manually by leaving numbers by student club representatives, there was no uniform system for reviewing these applications. Also, not all student organizations were known about, which could lead to results where students might not be aware of the existence of a potentially interested club.
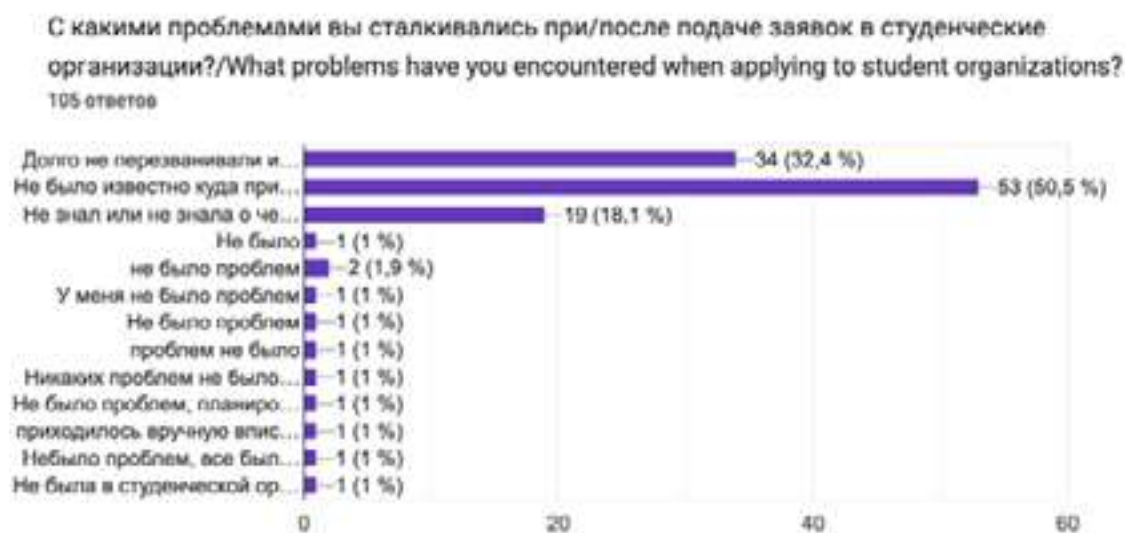

Figure 1.2 Online Survey

On the part of the organizers/leaders of student organizations, the main problems were that applications did not have time to be processed, and due to the large influx of applications, potential participants' contacts could be missed/ not noticed. In addition, there were those students who could leave an application without knowing about the idea of the club, due to which later there were refusals to join the organization.
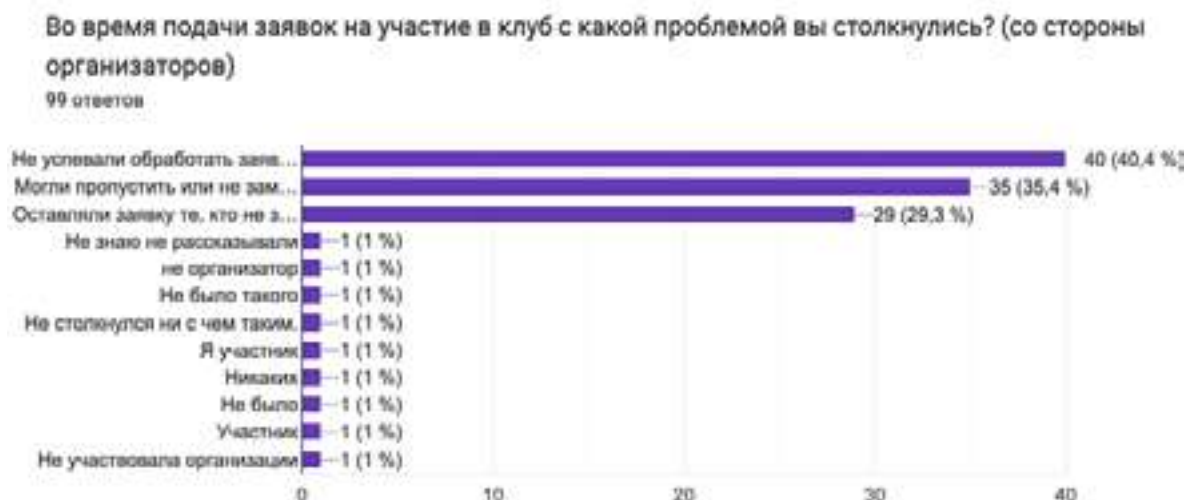
Во время подачи заявок на участие в клуб с какой проблемой вы столкнулись? (со стороны организаторов)

99 ответов

Figure 1.3 Online Survey

Thus, the need for such a platform with application automation functions and a dashboard to increase the visibility of existing student organizations was identified.

Before creating a website, it was necessary to analyse the system part of the project. Thus, three diagrams - Use Case, User Flow and Sequence Diagram - were designed to understand and consider what path of the user and the administrator of the page on the website.

The first diagram (Figure 2) shows the Use Case, which describes the interaction of system participants with a specific purpose. So, a Use Case diagram was created to design and describe the interaction between the user and the system. In this project, there are two main users – The site User and the Administrator. The Site User interacts with the site by viewing the main news, searching for posts by keywords, reviewing student club descriptions, and answering questions. On the other hand, the Administrator has access to edit the content on the site. To do this, you either need to register a new administrator account if you do not have one or log in with an existing login. The administrator then can add/edit/delete content such as accounts of student organization representatives and the clubs themselves, and news posts.
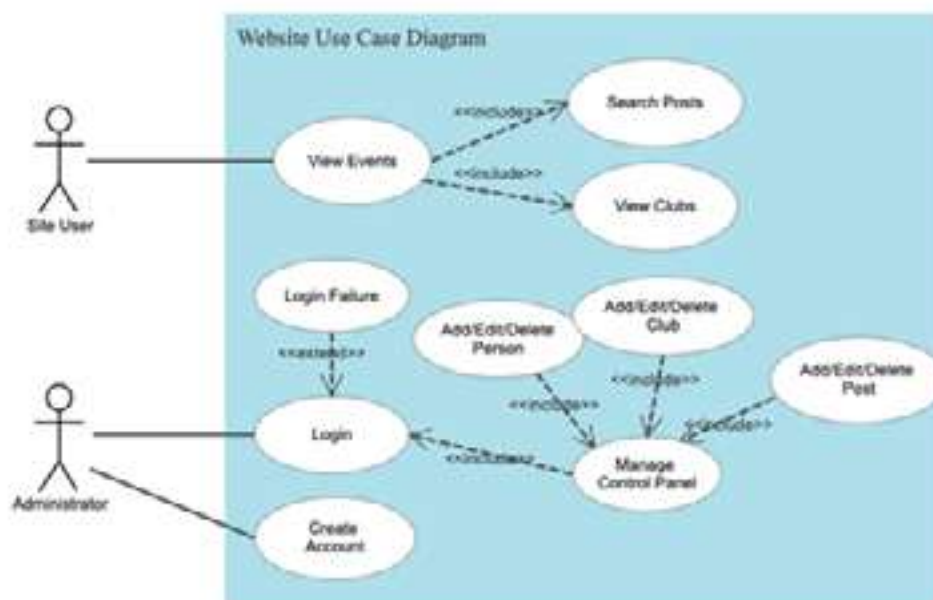

Figure 2. UML Use Case Diagram for Website

Another diagram is the User Flow Diagram (Figure 3), which is needed to visually represent the sequence of actions performed by the user to achieve the final goal. In this project, the final goal is to leave applications from students to join the club of interest. Thus, the user's path and each step from the entry point (home page) to the final interaction (leaving an application) have been demonstrated. Such a diagram helps to consider and analyse the user's path to fully understand the structure of the website.
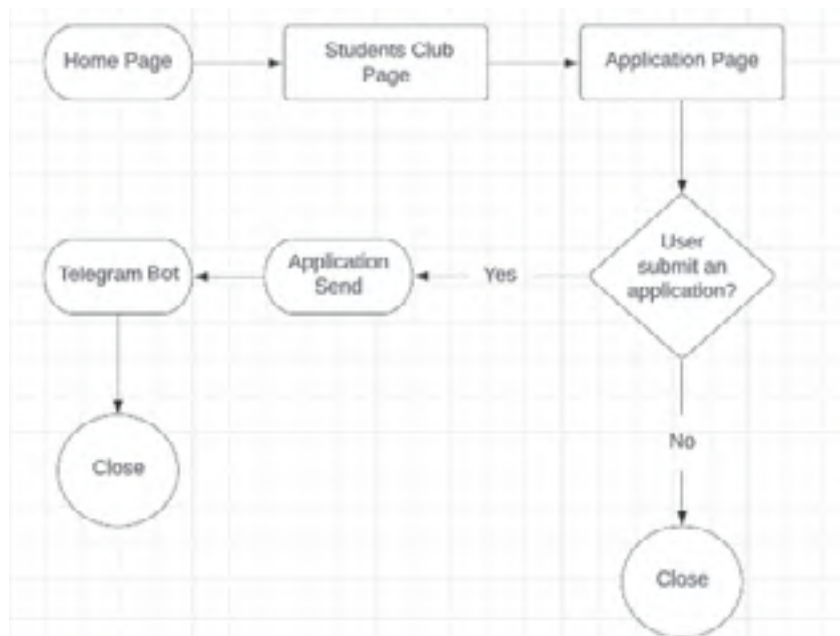
Figure 3. User Flow Diagram for Website

The last diagram (Figure 4) describes the logic of using the website as a script for documenting the project. Thus, it takes into account possible precedents that may appear during the development of the platform. This diagram helps to see the overall structure of the objects involved in the organization of the project. It looks at the interaction of objects with each other and the description of these actions. In this project, the objects are two users - User and Administrator, - Website, Student Organization Page, Application Page, Database.
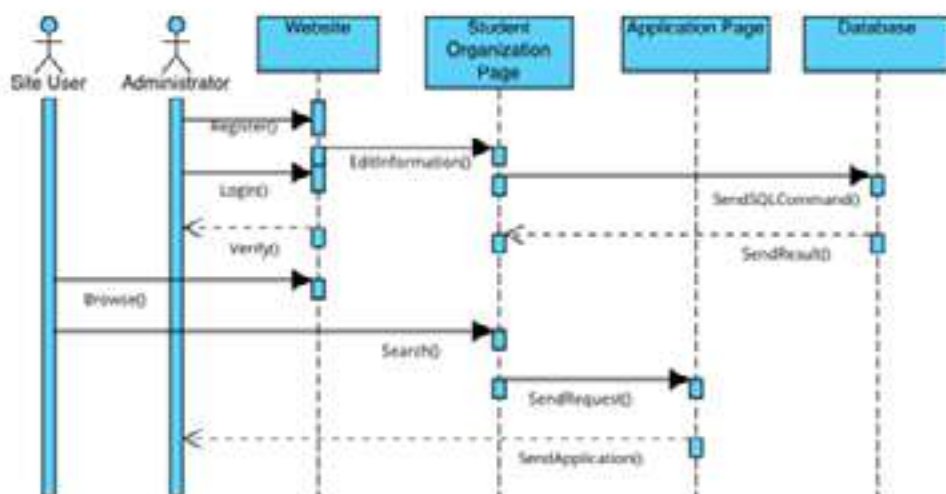
Figure 4. Sequence Diagram for Website

The visual structure of the site and design development

Website design begins with a UX strategy, where a plan for creating a website is being worked out. This plan includes three main components as a product vision, goals for implementation and a plan for creating a product. Vision allows it to structure ideas and ideas, providing a brief description of the future product and its characteristics. Goals are an indicator for the detailed parts of the site, that is, clear site features, content, and construction. The creation plan includes key points that the developers need to remember when creating a website with goals and vision.

The website for student organizations is designed in a dynamic style with elements of blue, white, and burgundy colours. The development of the composition of pages, that is, the position of objects and elements is arranged in a harmonious way, where the user can easily find the necessary information. By using a modular grid, blocks and page elements are visually ordered, which is convenient and readable for all users.

Development of technical elements of the site. Backend features

The important part of creating an IT product, especially a website, is backend development. The backend is the hardware and software part of the server that allows the site to fully perform functions. This part is not shown to users working on a remote server where the process of processing and storing data and connections takes place.

The structure of the backend on the website for student organizations includes processing, interaction, and formation of all teams, applications, and responses. The web server is the software that is responsible for the correct operation of functions, that is, client requests. For the backend part of the site, it is necessary to connect a server that will read PHP scripts. The XAMPP web server is connected to the website of student organizations. This helps to quickly deploy site data and build a local web server.

Processing requests from users get to the service with PHP scripts. PHP is a programming language that interacts with databases, which is also suitable for web development, accepting and processing applications and commands.

The script is responsible for processing the request, which can send a request to the database and change all the information in it.

Feedback is important for the operation of any site. Therefore, after processing the request and making changes to the database, the server must respond to the client's request. The operation is displayed on the HTML page and executed by a PHP script, after which it responds in the form of a JSON response.

The AJAX request is used to interact with the user in the backend part. The AJAX request does not overload the server, thus improving site performance and reducing response time. The response is sent to the user using a PHP script on the web server. However, the server part may make errors and take a long time to load. To do this, the program needs to notify the user about the error.

The database is needed for the proper operation of each website, preserving information and the ability to manage. All data and information available on the site are stored in a database. Data security is the priority of any official website. Since the SAKAZGUU website collects students' data, it is necessary to make sure that it is stored correctly and that leaks, and hacking are avoided. MySQL primary keys are used for this.

For the correct structure and distribution of information, a tabular record is used. This function writes data to tables, after which it is easier to find and update values. A record in the form of tables does not allow double repetition of data in which server errors occur. Thus, MySQL's primary keys provide high confidentiality and security, reducing the likelihood of data loss or corruption. PHP code is attached to the database using constants in the file "config/constants.php ". This file contains values for constants such as DB_HOST, DB_USER, DB_PASS and DB_NAME, which contain the data necessary to establish a connection to the database. The presence of errors is checked by the command "mysqli_errno()", where when it occurs, the function warns and terminates the function with "die()" Functions "mysqli_query()" and so on. send queries to the database. This method allows the server to conveniently and quickly use the site, where its requests will be processed and stored in a database using scripts and a web server.

Method of submitting applications
One of the main functions of a website for student organizations is the transmission and processing of student applications. Telegram was used for this. This project is an example of a simple Python Telegram bot using the python-telegram-bot library. It allows the creation of a bot that accepts applications from users and sends notifications about these applications to a specific chat or user.

Main components of the code:
- Importing the necessary modules and classes from the python-telegram-bot library.
- Setting up logging to receive information about the work of the bot.
- Determining the token of your Telegram bot. The token is provided when registering a bot on the Telegram platform.
- There is the user ID to which notifications about applications will be sent. This can be your ID or a specific chat ID.
- There is a start function, which will be called when the /start command is received. It sends a welcome message to the user and describes the format in which to provide information for the ticket.
- There is the process_information function that will be called when a text message is received from the user. It processes the information provided by the user and generates a

notification that is sent to a specific chat or user.

- Defining the main function that starts the bot. In this function, an Updater object is created with the passed token, command and message handlers are registered, and the bot is started to listen for new messages.

Optimization of business process

The business goal in creating this platform was to optimize and automate the acceptance of applications from KAZGUU University students to student organizations. The positions were considered from the perspective of three parties:

1. From the university side

2. From the club side

3. From the student's side

The project identified a hypothesis to improve the optimization of application processing. On the one hand, the university needs to collect accepted applications by collecting all applications from student organizations in the form of a single table. The university then collects students' data, which they manually enter and process for further analysis.

On the other hand, to recruit students to a particular student club, a casting call ad is placed, after which students respond to those ads. Then, based on the allocated selection criteria depending on the organization, club representatives select students over a set period. Student organizations interview students, then identify who passed the interview and send the results within an average of 3 business days.

The student must find information about the student clubs, the criteria and requirements for admission, and the deadlines for accepting applications. After passing all stages of the selection process, the student awaits the final results from representatives of the organizations.

The above takes a certain amount of time, which can be reduced by using this project. On average, it takes about 15 minutes for a student to accept applications, including browsing the site, finding a suitable club, and sending an application via the Telegram bot. For student organizations and the university, itself, the process of automating applications benefits in the form of reduced time to process applications from students.

As a result, instead of a lot of unprocessed data, this IT project helps reduce the time to process applications and optimize the analysis of all information.

Discussion

KAZGUU University students need a student organization web platform to improve work efficiency and facilitate the application process. The results showed that many students face numerous problems during the application process and in finding information about all organizations. The web platform for student organizations at KAZGUU University helps improve and streamline the application process. It will be easier for students to find information about each organization on this website. One limitation is the lack of funds to support the student website. Therefore, for future improvements, certain supporters or sponsors can be found to maintain this website. However, there may be restrictions on the promotion of this project. Therefore, it is possible to improve the performance of the website by working together with various interested IT companies, which can further help to solve the problem with the technical parts. Thus, it can attract more attention to this project, which will help develop the business plan. This business plan can bring numerous benefits not only to KAZGUU University but also to the educational system as a whole. Moreover, in case of increasing information in the database, there will be a need for additional help from the IT part.

One of the components of the product is a comparative analysis. Competing products on the market are the official web pages of various universities such as MIT University, Nazarbayev University, and other universities. The website of which provides general information about student life, existing student clubs, as well as individual web pages of student organizations. While the provided website for student clubs of KAZGUU University is a hybrid platform that combines all the necessary data about student organizations, the ability to create a student club, as well as an automated system for joining these organizations.

Conclusion

To summarize the work done, it is significant to note the participatory methodological approach taken to better understand the issue. As a result, online questionnaires, interviews with DSA (Department of Student Association) representatives, and interviews with the heads of student organizations played an important role. This methodological approach led to the main problems faced by

student organizations and stakeholders, i.e., limited availability of information, minimal visibility on online platforms, difficult process of student involvement, as well as limited analysis of data about the organization and participants. The main result of the conducted work was the need to create a unified online platform focused on student organizations of M. Narikbayev KAZGUU University. Thus, a single website was created through which interested persons have access to the function of submitting applications to the organization, along with representatives of the organization processing these applications. In addition, the website has a main page that displays the news of student organizations and a search function with which it can search for an organization of interest. Moreover, representatives of organizations have the opportunity to publish posts regarding student organizations. On the other hand, the website provides various options for the administrator, which include adding directly adding a student organization, adding users such as club heads, adding posts of tangent organizations, a user control panel, managing organizations, the ability to change data or delete, additionally the possibility to customize published posts. Despite all the listed qualities of the created product, there are some limitations. One of the main ones is financial constraints since the development and further implementation of a website require significant funds for maintenance. Furthermore, there are technological limitations, such as the availability of technological infrastructure and resources, as well as restrictions on the amount of data stored. Precisely because of the technical and financial constraints, a suggestion for further research is to conduct a user needs survey to assess satisfaction with the functionality of the website, besides exploring technological possibilities. Further development of this product may lead to implications for the information technology industry and future research, as the product may lead to the development of new technologies, improved data management practices, and a greater range of research opportunities in education. In conclusion, as a result of the conducted methodologies, a problem was identified, the solution of which was the creation of a website for a student organization, which in turn became a key moment for further development. The creation of a single platform is a suitable way to increase awareness among students, attract students, as well as improve interactions between students and student organizations. In addition, the advantages are simplicity, usability, and automation which affect the efficiency of work and further development. This project streamlines the acceptance and processing of applications for the university, student organizations, and students themselves.

Bibliography

1. Borges J.C., Ferreira, T.C., de Oliveira, M.S.B., Macini N. & Caldana A.C.F. (2017). Hidden Curriculum in Student Organizations: Learning, Practice, Socialization and Responsible Management in a Business School. The International Journal of Management Education. Retrieved from: https://www.sciencedirect.com/science/article/abs/pii/S1472811717300812

2. Vasilj M., Skender S., Jurdana M., & Horvat M. (2021). DESPRO: Decentralized Business Platform for Student Non-Profit Organizations. Retrieved from: https://www.researchgate.net/publication/355790258_DESPRO_Decentralized_business_platform_for_student_non-profit_organizations

3. Sobolevskaya, O. (2019). How Participating in Student Clubs Helps You Get a Good Job. Scientific and Educational Portal IQ. Retrieved from: https://iq.hse.ru/news/259060155.html

4. Sandeep & Singh Y.P. (2017). A Study on the Importance of Web Design, Development and Security in WSDM towards Web Development. Ignited Minds Journals. Retrieved from: http://ignited.in/I/a/89430

5. Macrini D. (2012). Online Social Matching Platform for Organizations. Online Social Matching Platform for Organizations - Learning & Technology Library (LearnTechLib), Publisher: Association for the Advancement of Computing in Education (AACE), San Diego, CA. Retrieved from: https://www.learntechlib.org/primary/p/41876/.

6. Vasilj M., Skender S. & Horvat M. (2021). Model for Improvement of Nonprofit Student Organizations Funding by Machine Learning and Digital Transition

to Blockchaim. Retrieved from: https://www.researchgate.net/publication/355887684_Model_for_improvement_of_nonprofit_student_organizations_funding_by_machine_learning_and_digital_transition_to_blockchain

7. Karani, A., Thanki, H., & Achuthan, S. (2021). Impact of University Website Usability on Satisfaction: A Structural Equation Modelling Approach. Management and Labour Studies, 46(2), 119–138. https://doi.org/10.1177/0258042X21989924

8. Bond, M., Buntins, K., Bedenlier, S. et al. Mapping research in student engagement and educational technology in higher education: a systematic evidence map. Int J Educ Technol High Educ 17, 2 (2020). https://doi.org/10.1186/s41239-019-0176-8

9. Shehzadi, S., Nisar, Q. A., Hussain, M. S., Basheer, M. F., Hameed, W. U., & Chaudhry, N. I. (2021). The role of digital learning toward students' satisfaction and university brand image at educational institutes of Pakistan: a post-effect of COVID-19. Asian Education and Development Studies, 10(2), 276-294.

10. Chopra, G., Madan, P., Jaisingh, P., & Bhaskar, P. (2019). Effectiveness of e-learning portal from students' perspective: A structural equation model (SEM) approach. Interactive Technology and Smart Education, 16(2), 94-116.

The Syrian Civil War as a Modern Proxy-War

Nurbolat Sagynganov

Abstract

One of the most intricate and destructive conflicts of the twenty-first century has been the Syrian Civil War, which started in 2011. Millions of people have been displaced, hundreds of thousands of people have died, and infrastructure and cultural heritage sites have been destroyed as a result of the conflict. The conflict, which started as a domestic uprising against the Assad regime, quickly expanded to involve both domestic and foreign parties. The involvement of outside parties in the conflict has been one of the main characteristics of the Syrian Civil War.

This research paper investigates the extent to which the Syrian Civil War can be considered a modern proxy war. The study examines the involvement of regional and global actors in the conflict using a variety of primary and secondary sources, including academic literature, articles, and reports. The paper investigates the motivations and goals of the various actors, the nature and extent of their involvement, and the impact of their actions on the conflict's outcome and regional order. According to the findings, the Syrian Civil War is a modern proxy war, with multiple external powers using the conflict to advance their own interests and agendas. The paper concludes by highlighting the challenges and implications of proxy warfare for regional stability and international security.

Keywords: proxy war, indirect intervention, Syrian civil war, national interests, regional order.

Introduction

Oppressed by the repressive regime, Tunisians began a wave of successful protests in 2010, which led to regime change in the country. This movement gave hope to the residents of the rest of the Middle East and was the beginning of a process that would later be called the "Arab Spring". Syria was no exception, and a number of protests took place in a number of major cities of the country. But all the protests were suppressed by the government in early 2011, and instead of democratization, full-scale armed conflicts began in the country, which later turned into a full-fledged civil war (Marshall, 2016).

The conflict was also influenced by regional and international factors. The complex confessional and ethnic composition of Syria, including the split between Sunni and Shiite Muslims, has turned it into a battlefield for regional powers and superpowers fighting for influence in the Middle East. Among these countries were the United States, Russia, Saudi Arabia, Iran, and Turkey. As a result, the civil war in Syria, which has been going on for almost 12 years, is one of the largest conflicts in the international arena in recent decades. "More than 465,000 Syrians have been killed in the fighting, over a million injured, and over 12 million – half the country's prewar population – have been displaced." (Al Jazeera, 2018).

For a better understanding of the conflict, the research question of this study was defined as: "What are the key factors that contributed to the fact that the Syrian civil war was classified as a modern proxy war, and how did these factors affect the conflict and its results?". This research question allows us to study the various elements that define the proxy war and how they manifest themselves in the Syrian conflict. It also involves an analysis of the impact of these factors on the course of the war and its final resolution. The proxy nature of the Syrian civil war has led to the emergence of a complex web of alliances and rivalries between various States and non-State actors, which has made conflict resolution a difficult task.

To answer this research question, the study will cover four main subtopics: The Civil War in Syria: History and Evolution: In order to understand the essence of the conflict, it is necessary to briefly consider its origins and the history of the country. To do this, the background of al-Asad's regime formation, the chronology of the conflict and how it evolved will be considered. The internal dynamics of the conflict, as well as the causes of the escalation of violence and the split of Syrian society, will also be covered in this sub-topic. In

addition, it will be considered how the Syrian government reacted to the opposition movement in the country and what it led to in the end. Great powers involved in the Syrian crisis: The second sub-topic will examine the involvement of great powers in the Syrian civil war. In the course of the study, it was decided to focus on US and Russia, which in one way or another participated in the conflict in Syria. The participation of these countries will be reviewed and evaluated in this chapter. The motives and reasons of these countries and how these countries interacted with each other in the framework of the Syrian Civil War will also be analysed. Regional powers involved in the Syrian crisis: In the third sub-topic, the involvement of regional powers, such as Turkey, Saudi Arabia, and Iran, will be analysed. This sub-topic will examine Turkey's duality in Syria, how it has built a relationship with both the United States and Russia in this conflict, and how Turkey has shifted its policy course depending on the behaviour of its allies. In addition to Turkey, the complex relationship between Saudi Arabia and Iran in the Syrian civil war will also be examined. Transformation of the conflict: The third sub-topic will be devoted to the study of the influence of foreign participation on the course of the conflict. As the conflict developed with foreign participants, the transformation/deterioration of the conflict will be analysed. Also, in this chapter, we will consider the general regional order and background system, which were formed or changed as a result of the participation of third parties in the conflict.

1.   Theoretical and conceptual framework

1.1   Conceptual framework

Since the main purpose of this study is to study the Syrian civil war through the prism of proxy war, it is necessary to study the concept of proxy war and understand its nature. To do this, the study will attempt to define proxy warfare based on previously studied literature. Concepts such as "military intervention" and what kind of support and intervention can be considered a proxy war criterion will also be considered. The study of the concept of proxy war is of great importance in understanding the regional order of the Middle East and the analysis of the foreign policy of the participants in this conflict.

In the modern literature, many studies on the topic of proxy wars (Marshall 2016, Oxnevad 2020, Rauta 2020, 2021, Rondeaux & Sterman 2019 Tamm 2014,) adopt or refer to the definition provided by Andrew Mumford (2013). According to Mumford (2013, p.1) "proxy wars defined as conflicts in which a third party intervenes indirectly in order to influence the strategic outcome in favour of its preferred faction" Some studies have also referred to stronger third parties as "patron states" and countries that accepted this support as "client states" (Bar-Siman-Tov, 1984). Also, Fox (2020), in his presented five models of strategic relationships in proxy-wars: exploitative, transactional, coerced, cultural and contractual models. Each model varies from the goals and motives of the proxy-client relationship and the national interests of both parties.

In the study of the reconceptualization of the concept of proxy war, Rauta (2021) defined proxy war as a type of intervention. He also mentioned that "In the simplest sense, intervention means large-scale military operations designed to influence strategic results" (2021, p.9). Further, in the same study, Rauta (2021) classified types of intervention and divided them into direct intervention and indirect (proxy) intervention (citing Regan 1996, 2010, Yoon 1997, Gleditsch 2007, Jones 2017). Yoon also classified the types of intervention and gave them a definition: "An indirect military intervention is an event that includes one or a combination of such activities as initiation or increase of arms supply or deployment of military advisers without participation in actual fighting. Finally, a direct military intervention, as the most explicit form of intervention, includes one or a combination of such activities as dispatch of combat personnel to the conflict zone, actual combat action, aerial bombing of targets, or naval assistance." (1997, pp. 585-586)

Often, direct intervention implies a risk of rapid escalation and higher losses for the patron country. This is why patron countries use proxy intervention (Loveman, 2002). For example, during the Libyan civil war, Hezbollah was created with the support of Syria and Iran as a proxy because direct intervention would have been too expensive. (Bayman, 2008 cited in Rauta, 2021)

By setting a certain conceptual framework, the study will draw on both primary and secondary sources, and look at "proxy-clients" relationships between actors in the Syrian civil war and consider more indirect intervention by third countries, but also by examining the dynamics of conflict, looking at the transition to more direct intervention, in situations where this is relevant.

1.2   Theoretical approaches

This theoretical framework will examine the concept of proxy war from the prism of three major international relations theories, which are realism, liberalism, and constructivism (Sell, 2012). After a brief review of these three theories and their manifestation in the Syrian Civil War, an analysis will be conducted to provide an answer that best explains the concept of proxy war and justifies its relevance to the Syrian context.

The theory of liberalism in international relations states that the most important asset is human life and basic human rights. And the most important national interest of a country is its inhabitants and their well-being. This theory denies the need for military intervention or imperialism. Liberalism also asserts the need for institutions and norms that will create benefits for the people and share political power. Liberalism tries to encourage more humane and peaceful instruments of foreign policy. According to liberalists, relationships between countries should be built on mutual trust and cooperation. (Meiser, 2018).

If one takes the theory of liberalism to the concept of proxy wars, one can view proxy war as a failure of institutions, diplomacy, and international norms. As democracies liberal countries avoid military conflicts because they are costly and inhumane. But on the other hand, a democratic country can start or engage in a military conflict with a non-democratic country in order to spread liberal views, spreading the process of democratization. For example, the armed conflict between the U.S. and Iraq in 2003. (Meiser, 2018)

The constructivist approach in international relations emphasizes the importance of ideas, norms, and identities of actors in international relations. From a constructivist perspective, it is ideas and actions that shape reality (Theys, 2018). For example, in his writings, Wendt pointed out that actors' actions depend on their identities and shared interests (Mengshu, 2020). All of these constructivist variables are interrelated and influence each other. "Without interest, identity has no motivational power; without identity, interest has no direction" (Mengshu, 2020 cited Wendt, 1999, 231).

If we consider constructivism as a tool for analysing proxy wars, however, it views its nature as a consequence of actors' ideas and identities. Proxy countries support weaker client states that share similar ideas and identities. For example, Iran supports Syria because both countries are governed by Shiite Muslims, and their interests converge to maintain this identity within the country. (Baltacioglu-Brammer, 2013). From a constructivist perspective, Proxy wars can be viewed as an expression of competing identities and the struggle for dominance or survival of specific ideas, values, or ideologies. By examining the social and ideological aspects of proxy wars, constructivism allows us to understand how ideas and identities shape conflicts. For this particular study, constructivism can be of great value because the origins of the Syrian civil war have ethnic causes and to this day, the fighting takes place between members of different ethnic groups and religious branches.

The third theory of international relations to which this study will refer is realism. In realism, the state is a rational and sole actor on the world stage, whose main objective is survival (Antunes & Camisão, 2018). For this purpose, realism operates with basic concepts like power, balance of power and national interest. These three concepts are key in realism and each of them is interrelated.

When it comes to proxy wars, from a realist perspective, larger countries support weaker countries in order to advance their strategic interests and increase their influence. Because the state is rational, proxy wars allow it to achieve results and its own goals in a conflict without risking its own resources and forces. Also, proxy war allows the state to expand its spheres of influence and maintain a balance of power in different regions simultaneously. In the case of the Syrian civil war, realism suggests that regional and world powers support opposing factions to secure their influence in the region, control vital resources or create a counterweight to each other.

Among the three theories, realism seems to

provide the most comprehensive explanation of the concept of proxy war and its manifestation in the Syrian civil war. Realism's emphasis on power, national interests and balance of power explains well the behaviour of states in the Syrian crisis. Competition for influence, control of resources, and the desire to shape regional dynamics are all key aspects that realism effectively reflects.

While liberalism and constructivism offer valuable insights into specific aspects of proxy wars, such as the involvement of NGOs, terrorist groups, violations of norms and international law, social factors, and the identity of participants, they do not provide as comprehensive an explanation as realism in the context of the Syrian civil war. The main drivers of the proxy wars in Syria revolve around power struggles, which makes realism the most appropriate theoretical lens for analysing and understanding the dynamics of what is happening.

1.3   Methodology

The Syrian crisis has been ongoing for more than 10 years and is one of the most protracted and large-scale conflicts of the 21st century. In this regard, we already have a large amount of literature on both the Syrian crisis and the concept of proxy wars. Therefore, this study will use a qualitative method of research and a secondary method of data collection. This study relies heavily on existing literature and the interpretation of previous studies. Therefore, this thesis will use a descriptive-interpretive approach.

The interpretative approach of qualitative research staging open-ended research approaches, involves collecting open-ended (nonnumerical) data, systematically analysing existing work to extract meaningful ideas, and constructing a coherent narrative (Elliot et al., 2021). Also, by reviewing existing literature, research can gain a deeper understanding of the situation, and obtain some data and facts, from first-hand sources who were directly at the epicentre of the conflict. Then, by analysing and interpreting the data, come to one's own conclusions in order to build a picture of what happened in Syria.

2.   Syrian Civil War: History and Evolution

2.1   Background: The dynasty of Hafez al-Assad

For a general understanding of the background and origins of the conflict, it is necessary to look not only at the period of the Syrian president, Bashir al-Assad, but to begin with the vector of the country's development set by his predecessor and father, Hafez al-Assad. It should also be noted that Hafez was born into an Alawite family and was himself an Alawite. The Alawites are an ethno-religious minority historically located primarily in the Levant and adhere to Alawism; a sect of Islam derived from Shiite Islam (Cosman et al., 2008).

Hafez al-Assad began his political ambitions with several military coups. On his way to power and to increase his influence inside the country, Hafez al-Asad built his career as a military man and actively manifested himself in the Baath Party. (Seale, 1989) As a result of the military coup in 1970, initiated by General Hafez al-Assad himself, he as an Alawite brought this ethnic minority to power. As a result, in 1971 Hafez Assad became the first Alawite president of Syria (Baltacioglu-Brammer, 2013).

To further examine the situation in Syria, it is necessary to dissect the neo patrimonial regime that has been established in the country. Neo patrimonial regimes are hybrids of personal and bureaucratic power, which are predominantly common in the Middle East. The use of primordial connections to create a core of trusted followers around a patrimonial leader is a historically reproducible technology of power (Hinnebusch, 2019).

Thus, as president of Syria, Hafez al-Assad was able to build a kind of "monarchy" in the country by appointing Alawites close to him to command positions in the country. Thanks to this, people from Hafez's family could not only suppress but also conduct brutal repression against the opposition and Sunnis, who made up the majority of the country's population. (Holliday, 2011) Although most of the security apparatus positions were held by Alawites, the fact that the ethnic majority of the country was Sunni began to show the most significant flaws in the regime that Hafez al-Assad had built. Even though Hafez had built a "wall" of loyalists from his family around him, he was

predominantly ruled by Sunnis, who in turn were already dissatisfied with the order that had been established by the president. Serving the Alawites and the constant repression only built-up animosity toward the president's personality.

2.2 Origins of the conflict: The rule of Bashir al-Assad

Having considered the rule of President Bashir al-Assad's predecessor, we can say, that the regime that was created by Hafez al-Assad, although it had its drawbacks, was still quite stable. After 30 years of Hafez Assad's rule, he died of heart failure in 2000. At the age of 34, the current President Bashir al-Assad became the nominal successor of the country. But due to the minimum age for presidential candidates, Bashir could not become the head of the country. After that, the Syrian Parliament amended the constitution, lowering the minimum age of a presidential candidate from 40 to 34 years (Fares, 2014). Thus, on July 17, 2000, Bashir al-Assad became President of Syria. These amendments to the constitution were negatively accepted by the opposition public of the country.

Despite the fact that Syrian President Bashar al-Assad came to power, in his speech to the delegates of the Baath party, Bashar stressed the need to modernize the party and added that "The continuity of the party depends on its ability to adapt to today's reality in Syria and to changes in various spheres of state life." (Zisser, 2004). Positioning himself as a reformer, he put himself in an awkward position, creating feelings within the Alawites and as a stabilization of the political situation for the Sunnis inside the country.

Baltes (2016) also mentioned in her work that during his inaugural speech, President Bashar not only praised his father for his achievements, but also criticized the failed Syrian institutions and government policies, called for reducing corruption and increasing transparency, and also touched on the topic of democracy.

In the course of political reforms, in 2005 at the party congress in 2005, Bashar al-Assad was able to concentrate power in his own hands and remove the "old guard" from the narrow circle of the government (Hinnebusch, 2019). But unfortunately, this was not an act for the sake of creating a transparent and honest government.

By this act, Bashar al-Assad has only narrowed the circle of the inner core of the government and strengthened his influence in the country. For example, as Zintl et al. (2015) write, after 2005 a new elite in the person of technocrats began to come to power. The main task of which was to conduct new economic reforms focused on modern capitalist realities. As a result of which, Bashar's family, in particular, his cousin Rami Makhlouf, had the opportunity to increase their capital. The modernization of authoritarianism created the illusion of democracy in the country and was able to ensure the survival and development of the Assad regime. A partial result of such reforms was described in the book Syria: From national independence to proxy war:

The purge of the old guard Sunni barons had narrowed the elite and cost the al-Asad government the support of their clientele networks in Sunni society. It made the regime over-dependent on the presidential family, Alawi security barons and technocrats lacking support bases. Bashar had debilitated the party apparatus and the worker and peasant unions, which he saw as resisting his reforms, but this also enervated his regime's connection to its rural Sunni constituency (Hinnebusch, 2019, p.35).

As a result, sectarian violence between Alawites and Sunnis began to increase in Syria.

2.3 Evolution: "Syrian spring"

In 2011, a democratic uprising began in Tunisia, which further developed in the countries of the Middle East. The Arab Spring has become a point of no return for the countries of the region. Oppressed by authoritarian regimes of different countries, they began to go to rallies and demonstrate their discontent. Poverty, a low level of economy, lack of human rights and a repressive regime are what caused residents to turn against the governments of their countries. Syria, of course, was no exception. In Syria, the situation was even more complicated, for the reason that various opposition groups and ethnic groups began to unite against the Assad regime. And in order to keep power in his hands, Bashar al-Assad again began to strengthen relations between the Alawites, promoting them to high positions in the government (Baltacioglu-Brammer, 2013).

It was this event that caused the popular unrest to escalate into a large-scale civil war against the Assad regime. Looking back at the history of Syria over the past half century, we can say that it was inevitable. This time, to contain the protesters in his country, Bashar began to seek support from outside. To do this, he began to enlist the support of Iran and Hezbollah in Iran. This decision could provide the regime not only as another authoritarian government whose popularity was declining in the Arab world, but also as a Shiite state rooted in the region against neighbouring Sunni states (Baltacioglu-Brammer, 2013). Also, in her article Baltacioglu-Brammer mentions that:

"Al-Assad began to position himself as a pious Shi'ite through public events, appearances, and organizations. And the main Shi'ite political and military organizations in the region, Hezbollah, and Iran, decided to back up the Assad regime in very concrete ways. They sent much needed financial and military support and ideologically bolstered Bashar al-Assad's fight against the Sunni "terrorists.""

It was this decision by President Bashar al-Assad that fundamentally changed the vector of the conflict. By enlisting Iran's help, Syria has become an arena for more global conflicts.

3.   Great powers involvement in the Syria Crisis

3.1   The US policy in the Syria

The U.S. policy towards Syria cannot be considered without mentioning U.S. influence and involvement in other countries of the Middle East. Since the end of WW2, U.S. foreign policy has been focused on protecting and maintaining its national interests and maintaining hegemony in the international system. The War on Terrorism served as the impetus and justification for advancing the US hegemonic project (Jackson, 2011). Under the auspices of the Global War on Terrorism, the US engaged in armed conflicts in Afghanistan and Iraq in 2001 and 2003, respectively. This policy of the war on terrorism has led to a wave of criticism of the US. Many have attributed the US. to imposing its world order on other countries and destabilizing the regional order. Operation Iraqi Freedom was not recognized by the United Nations at all. "Former UN Secretary General Kofi Annan, in an interview with the BBC World Service, explicitly stated that the US-led war in Iraq was illegal" (MacAskill & Borger, 2004).

The policy followed by the U.S. under President Bush Jr. led to a tainted image of an invader and a rise in anti-Americanism. Therefore, the Obama administration adopted a new foreign policy approach, which implied "leadership from behind" and "direct non-interference (Eksi, 2017). This policy of President Barack Obama is more restrained and does not imply direct military intervention in the conflict. Washington's first reaction to the protests in Syria was to impose sanctions against several Syrian officials and Bashar al-Assad himself (Al Jazeera, 2019).

But sanctions against the Syrian rulers were ignored, and as a consequence of Obama's new policy, Washington decided to support opposition groups that opposed the Assad regime. One such group is YPG (People's Self-Defense Units) which is a military unit of PYD (Kurdish Democratic Union Party) (Davis et al., 2017). Support to the YPG, which was led by the CIA consisted of providing weapons, intelligence, air support, and training. In August 2013, the Syrian government used chemical weapons against civilians for the first time (Price, 2022). After such actions, the US could not stand idly by, and President Barack Obama issued an official statement condemning the actions of Bashar al-Assad and stating that such actions by the Syrian government directly impacted US national security interests. As part of this speech, Obama also stated that in order to protect its own national interests, the US could respond to such actions with a targeted military strike (Obama, 2013). As mentioned earlier, Russia was also involved in the Syrian civil war, and it was not beneficial for Russia to directly intervene in this conflict because Russia supported the Assad regime. Just three days after Obama's speech, Russia offered Syria to hand over control of its chemical weapons to the international community for dismantling to avoid a US military strike (Strobel & Karouny, 2013). This incident is also well described in Eksi's work (2017):

"In this sense, the United States has managed to use its rivals to carry out its policy without direct interference. In other words, even the possibility of direct US intervention in the Syrian crisis by military force ensured compliance with the

requirements of US policy on the part of Russia."

From 2011 to 2017, Washington continued to pursue its own policy of "direct non-interference" and only provided humanitarian and financial support to Syrian opposition groups. Then in 2017 Obama resigned and was replaced by Donald Trump, who made it clear that he would stay out of Syria. It was Washington's new policy on the conflict in Syria that gave Assad carte blanche, after which, in the spring of 2017, Assad again uses chemical weapons against his own people (Deutsch, 2017). Further, this decision by Assad was called by Trump "an affront to humanity." "I will tell you that yesterday's attack on children had a big impact on me - a big impact," "My attitude toward Syria and Assad has changed a lot," Trump said in his speech (Borger et al., 2017).

After this speech, Trump orders airstrikes. On April 7, 2017, the White House launches dozens of Tomahawk missiles at the Syrian airbase of Shayrat, considered the site of the chemical attack. This was the first direct U.S. action against Assad and his regime (Al Jazeera, 2019).

3.2   Russian motives in the Syria

Russia has been a long-standing strategic ally of Syria and, in particular, of the al-Assad family. Their alliance dates back to the 1950s and is, though complex, quite close (TASS, 2015). This relationship between the two countries grew closer as Syria became involved in more regional conflicts. The Soviet leaders needed Syria as a shining example of their magnanimity, military might, and reliability (Lund, 2019). It was for this reason that the Soviet Union never stopped providing both military and humanitarian support to Syria, continuing to sell arms and military equipment that supported the Syrian Army. In the dossier on military-technical cooperation between Syria and Russia, the following information was provided: "Between 1956 and 1990, Syria was supplied with weapons worth over $26 billion, including 65 tactical and operational-tactical missile systems, about 5,000 tanks, over 1,200 combat aircraft, including Su-22, MiG-29 and Su-24MK, 4,200 artillery pieces and mortars, surface-to-air missile systems, about 70 warships and boats. By the end of the 20th century, the Syrian army was more than 90 percent equipped with Soviet weapons." (TASS, 2015)

As the conflict progressed, the Kremlin grew increasingly tense. With the overthrow of the Assad regime, Russia could lose one of its important importers of Russian arms. Besides material interests, this conflict was an opportunity for Russia to regain power in the Middle East and increase its influence in the world. Trenin wrote: "For the Russian military, still in the process of post-Soviet transformation and modernization, Syria was a return to the premier league, albeit on a relatively small scale." (2016, p.2) For Russia, and Vladimir Putin in particular, Syria was an opportunity to restore the country's position as a great power outside the former Soviet Union. The Middle East was a key testing ground for Russia's attempt to return to the world stage. (Trenin, 2016)

In general, from 2011 to 2015, we can say that Russia, as well as the U.S., followed a policy of direct non-interference and was not directly involved in the conflict. All Russian support consisted only of financial assistance and the provision of weapons and military equipment. Russia avoided direct confrontation with its main opponent, the United States. In 2013, Russia even went towards the US and showed its concern about Assad's use of chemical weapons (Strobel & Karouny, 2013).

But as Bashir al-Assad's regime became increasingly threatened, on September 30, 2015, the Russian Federation officially entered the Syrian civil war. (Petkova, 2020) The fall of Assad would be a serious blow to Russia, as it would primarily threaten Russia's personal national interests and deprive them of another ally in the Middle East. Another factor that prompted Russia's direct intervention in Syria in 2015 was the Ukraine crisis. Involvement in the conflict in Syria allowed Putin to solve the problem of political isolation after Ukraine and also allowed Moscow to lead in a complex relationship with the United States. (Weiss & Ng, 2019). Moscow tried to present itself as a power that resolutely fights terrorism in order to start cooperation with the U.S. and break the cohesion of the West, which strengthened after the Ukraine crisis and to make itself look good. (Kofman & Rojansky, 2018)

4.   Regional powers involvement in the

Syria Crisis

4.1 The duality of Turkish foreign policy

Turkey's position in this conflict may seem very ambiguous, because when studying the Syrian civil war, it seems that Turkey defended its own national interests and fought on several fronts, trying to "sit on two chairs. Since the beginning of the Syrian civil war, Erdoğan has made clear his negative attitude towards the Assad regime and called for regime change in Damascus. (Siccardi, 2021) However, Turkey was not in a hurry to intervene directly in the conflict. Turkey's primary concern in this conflict was to maintain security on the border with Syria and tried to stabilize the region, as it did not benefit from the fighting in neighbouring territories. Turkey supported the Arab League's plans to stabilize the region and fight the repressive Assad regime. (Yazıcı, 2018). At the beginning of the conflict in Syria, Turkey together with Qatar and Saudi Arabia provided weapons and military equipment to opposition groups. Turkey also provided military training to Syrian dissidents on its territory, who later formed a military group called the Free Syrian Army. (Manna, 2012) Despite Turkey's restrained policy towards Syria, numerous hostilities on the border between the two countries created a "tense atmosphere" in Turkey.

Turkey first directly engaged in the Syrian conflict in the summer of 2015 after ISIS suicide bombing in Suruç city, which is near the Syrian border. Turkey's policy in this conflict has focused on fighting the terrorist organization ISIS and its ally, the Assad regime (Shaheen & Letsch, 2015). Also, ISIS took over the northern part of Syria, which was home to Syria's largest ethnic group, the Kurds. To fight ISIS, the U.S. began to support the Kurds by providing them with weapons and military equipment and air support. The rise of the Kurds was seen as a threat by President Erdoğan because the YPG, which was supported by the US, is part of the banned Kurdistan Workers' Party (PKK) according to Turkey (Yazıcı, 2018). The PKK has been fighting the government for decades as they demanded a Kurdish autonomy within Turkey. This threatened Turkey's national interests and put its territorial integrity at risk. As a consequence, Turkey fought not only the Assad regime, but also the YDG, which was supported by the United States.

This clash of interests between the U.S. and Turkey has only aggravated the situation in the region and created tension between the two countries, despite the fact that both countries are members of NATO and allies in the fight against the Syrian government. As a consequence, the allied relationship between Turkey and the United States was interrupted. Against this backdrop, Turkey was able to get closer to Russia, which further led to a change in the balance of power in Syria (Eksi, 2017). Despite the effectiveness of this alliance, we can say that it was short-lived, as the main interests of these two countries in this conflict were different. The only thing they had in common was that both sides were fighting against the PKK, PYD, and YPG opposition groups, which had secured US support. The relationship between Turkey and Russia is well described in Eksi (2017): "Turkey made a change in its Syria policy and turned into the policy of balance with Russia against the US. With this policy, Turkey had the chance to increase its military presence in Syria."

4.2 Saudi Arabia – Iran rivalry

4.2.1 Iran

Iran is one of the first countries to be involved in this conflict. Iran began to support the regime of Bashir al-Assad, against the background of the long-standing friendly relations between the two countries. Another factor was the Alawite roots of the al-Assad family, which come from Shiite Islam. From the beginning of the conflict to this day, Iran has been one of the Syrian government's biggest allies. Iran provides both military and financial support to opposition forces in Syria. (Jenkins, 2014) The alliance between Iran and Syria also stems from common views in the countries' foreign policy, such as the creation of the Islamic State, historical alliances with the USSR/Russia and opposition to the Western democratization process in the region. (Wastnidge, 2017) Moreover, the first state which recognized the Islamic Republic of Iran was Syria. (Piotrowski, 2011 cited in Yolcu, 2016)

For Iran's long-term regional strategy, the preservation of the Shia-Alawite regime in Syria, and later in the Levant, was categorically important for Iran and the ideology of the

Islamic Republic and the confrontation of Saudi Arabia for regional power. Therefore, Iran used the religious aspect to justify its involvement in the conflict. The Iranians, by sending their military, wanted not only to save the Assad regime, but also to justify their troops in Syria, close to the border with Israel, which could be of strategic importance in the future.

To further its interests, Iran used not only its own troops, but also supported the Lebanese "Hezbollah," various military groups and regional rebel factions in Syria. One of the military groups that Iran sent to Syria was the so-called the Quds ("Jerusalem") Force, which was Iranian revolutionary guard's expeditionary army. At the height of the civil war, to fight the opposition, the Quds Force in Syria consisted of some 80,000 Shiite militias. These militias also included Hezbollah fighters, mainstream Iraqi Shiite fighters, and Afghan and Pakistani Shiite militias, commanded by nearly 2,000 officers of the Islamic Revolutionary Guard Corps (IRGC) and the Quds Force. (Uskowi, 2018).

Beyond the struggle for power and regional power status, ideological opposition to Saudi Arabia was not the only motivation for Iran's foreign policy in Syria. Iran needed a permanent presence in Syria, establishing permanent command centres and military bases in the country. Because, in addition to Saudi Arabia, another historical enemy of Iran is Israel. And control of the Syrian Israeli borders is an important factor when considering Iran's involvement in this conflict. Also, a permanent presence and increased supply of weapons to Syria, would create a permanent land corridor from Iran to Lebanon and Syria.

4.2.2 Saudi Arabia

The wave of revolutions in the Middle East could not pass unnoticed by Saudi Arabia. The Saudis have always been interested and actively involved in the politics of the countries of the region. Although during the Arab Spring, Saudi Arabia was most frightened by the democratization process in much of the Arab world, the Saudis reacted differently to each country and sought a different approach depending on their own interests. For example, Saudi Arabia actively participated in the fight against the regime of President Ali Abdullah Saleh in Yemen and also supported the intervention of NATO countries in Libya, after which former Libyan President Muammar Gaddafi and his regime were overthrown. On the other hand, Saudi Arabia has tried in every way to preserve the regimes of al-Khalifa and Hosni Mubarak, the former presidents of Bahrain and Egypt, respectively. (Berti & Guzansky, 2014) In each of the above revolutions, the Saudis defended their national interests, and such involvement in internal conflicts of "neighbours" only shows their intention to become a hegemon in the Middle East. Another motive for involvement in this conflict was the growth of radical Islam and its spread in the Middle East. (Blanga, 2017) The development of this "trend" strongly threatened the legitimacy of the royal family.

The Syrian civil war is no exception, and Saudi Arabia's interests in Syria are well explained by its relationship with Iran. It is the rivalry between these two countries that has complicated the conflict, making it longer and more destructive. It is in Syria that the two regional powers conduct their most open political confrontation. (Hokayem, 2014) Saudi Arabia has always been concerned about the Alawite roots of the al-Assad family, and the fact that Alawites are in power in Syria. As mentioned earlier, Sunni Muslims in Syria have not infrequently been repressed and oppressed by the Assad regime. Therefore, primarily for the Saudis, Syria was an arena to promote their ideology and save their "brothers."

Although Saudi Arabia tried to prevent direct intervention in Syria, El Riyadh used its leverage to reduce the influence of the Iranian Syrian "Shiite axis. For example, they tried to promote an initiative to exclude Syria from the Arab League. (Berti, 2017) In addition to diplomatic and political methods, the Saudis have actively supported rebel groups with financial aid, arms, and equipment. In 2013, The Times reported on Saudi funding and provision of small arms to fighters against the Assad regime in Syria. In addition to small arms, numerous anti-tank weapons, such as American-made TOW anti-tank missiles, were also provided. (Ellison, 2016)

While the conflict in Syria is quite protracted, and the Saudis do not always disclose information about the opposition military groups they support, some sources indicate that Saudi Arabia

has supported groups such as: Free Syrian Army (FSA), the militia coalition Jaish al-Islam (Islamic Front), Jaish al-Fatah (Army of Conquest), Al Qaeda's Syrian affiliate Jabhat al-Nusra, jihadist-Salafist group Ahrar al-Sham and Jabhat al-Nusra. (Ellison, 2016) There is no specific information in public sources about how much has been spent on supporting militias in Syria. But based on information provided by Blanga (2017): "In 2014, Crown Prince Salman travelled to Paris, where he spent $1 billion on weapons for the Lebanese army to help it overcome the threat posed by jihadist groups in Syria," we can conclude that Saudi Arabia is spending ("investing") billions of dollars to support the opposition in Syria.

5.   Models of Strategic Relationship in Proxy War

After 12 years of conflict in Syria and the involvement of several actors, by analysing the level of involvement of countries in the Syrian civil war, we can draw some conclusions and select models of strategic relationships in proxy war. Earlier in the conceptual framework, five models of strategic relationships in proxy war were indicated, which are: exploitative, transactional, coerced, cultural and contractual models Fox (2020).

Fox cites the relationship between Russia and the Assad regime as an example of a transactional model, emphasizing the main criteria of this model. For example, according to this model, "the proxy state is often a strategic intermediary of the client state, the proxy state government is not subjugated to the client state, the proxy-client relationship is dominated by a running clock - objectives achieved drive divergence, also sponsor state has fixed political and social interest in the principal; dependence will end when objectives are met" (for example, Russia has reduced its presence on Syrian territory after the US forces withdraw (2020, p.7.) But in turn, this study also emphasizes Russia's involvement in the contractual model, as there are facts proving the presence of the private military corporation "Wagner group" on the territory of Syria (Gibbons-neff, 2018).

As for the U.S. involvement in the Syrian crisis, the U.S. can also be attributed to the contractual model, as the U.S. as well as Russia has sponsored the participation of a private military corporation

in Syria and the fight against the Assad regime. The best-known American PMC on the territory of Syria was "Academy" (ex "Blackwater") (Gibbons-neff, 2018). Of the pluses of the contract model, there is increased secrecy, cheap but at the same time rapid response, lower risks, and the ability to deny direct military intervention (Fox, 2020).

To describe the case of Saudi Arabia and Iran, one cultural model fits. This model is based on support from proxy clients, by cultural, religious, and ethnic similarities. This model best describes Saudi Arabia's support for Sunni minority and military groups and Iran's sponsorship of Shiite militia groups.

Turkey's involvement in the conflict is best explained by the coercive model. The criteria of this model are the low level of trust between proxy and client, not high interest in fighting a common enemy, physical presence as the only factor maintaining the relationship. "Enemy of the enemy, but not a friend," is the expression that best describes the duality of Turkey's policy in the Syrian crisis.

Conclusion

The Syrian civil war is indeed one of the most protracted and destructive conflicts of the 21st century. Millions of refugees and hundreds of thousands of deaths have been the victims of a political regime, and further a major proxy war between regional and world powers. The Syrian crisis has exhausted itself as a civil war between the Assad dictatorship and the opposition. As the country to this day, it is experiencing a geopolitical and ideological rivalry between third countries. Syria was the first major example of proxy war in the post-Cold War era. Syria has also become just another Middle Eastern country where regional powers like Saudi Arabia and Iran are conducting their sectarian clashes between ethnic groups.

Syria is a good classic example of a proxy war. Regional conflicts and rivalry between Saudi Arabia and Iran have always taken place in the modern Middle East, and the Syrian crisis can be called another stage in the protracted rivalry between regional hegemons. Even after 12 years, fighting is still going on between the ruling government and the opposition, and it is difficult to predict when this conflict will

end. The Syrian civil war also signals Russia's return to the "big leagues," demonstrating its influence in the region. Moreover, this conflict shows that the regular change of power in the United States can have a negative impact on the country's sphere of interests, as each new leader sets a new direction for foreign policy.

References

1. Al Jazeera. (2018, April 14). Syria's war explained from the beginning. News | Al Jazeera. Retrieved April 25, 2023, from https://www.aljazeera.com/news/2018/4/14/syrias-war-explained-from-the-beginning

2. Al Jazeera. (2019, October 7). Timeline: US intervention in Syria's war since 2011. News | Al Jazeera. Retrieved May 4, 2023, from https://www.aljazeera.com/news/2019/10/7/timeline-us-intervention-in-syrias-war-since-2011

3. Antunes, S., & Camisão, I. (2018, August 5). Introducing realism in international relations theory. E-International relations. Retrieved May 22, 2023, from https://www.e-ir.info/2018/02/27/introducing-realism-in-international-relations-theory/#:~:text=Realism%20is%20a%20theory%20that,central%20authority%20above%20the%20state.

4. Baltacioglu-Brammer, A. (2013, November). Alawites and the fate of Syria. Origins. Retrieved April 25, 2023, from https://origins.osu.edu/article/alawites-and-fate-syria?language_content_entity=en#:~:text=The%20Alawite%20presence%20in%20the,first%20Alawite%20President%20of%20Syria.

5. Baltes, C. M. (2016) "Causes and Consequences of the Syrian Civil War". Senior Theses. 105, 43-44. Retrieved April 23, 2023, from https://scholarcommons.sc.edu/senior_theses/105

6. Bar-Siman-Tov, Y. (1984). The Strategy of War by Proxy. Cooperation and Conflict, 19(4), 263–273. Retrieved April 29, 2023, from https://doi.org/10.1177/001083678401900405

7. Byman D. L. (2008). The Changing Nature of State Sponsorship of Terrorism. The saban center at the Brookings institution. Retrieved May 25, 2023, from https://www.brookings.edu/wp-content/uploads/2016/06/05_terrorism_byman.pdf

8. Berti, B & Guzansky, Y (2014) Saudi Arabia's Foreign Policy on Iran and the Proxy War in Syria: Toward a New Chapter?, Israel Journal of Foreign Affairs, 8:3, 25-34, DOI: 10.1080/23739770.2014.11446600

9. Blanga, Y.U. (2017), Saudi Arabia's Motives in the Syrian Civil War. Middle East Policy, 24: 45-62. https://doi.org/10.1111/mepo.12307

10. Borger, J., Smith, D., & Rankin, J. (2017, April 6). Syria chemical attack has changed my view of Assad, says Trump. The Guardian. Retrieved May 4, 2023, from https://www.theguardian.com/us-news/2017/apr/05/syria-chemical-gas-attack-donald-trump-nikki-haley-assad

11. Brown, G. W., McLean, I., & McMillan, A. (2018). In The concise oxford dictionary of politics and international relations (4th ed., p. 67). Oxford University Press. Retrieved May 4, 2023, from https://www.oxfordreference.com/display/10.1093/acref/9780199670840.001.0001/acref-9780199670840

12. Cosman, M. P., & Jones, L. G. (2008). In Handbook to life in the medieval world, 3-volume set. p. 407. Retrieved May 4, 2023, from https://books.google.kz/books?id=-Jf5t1vFw1QC&pg=PA407&redir_esc=y#v=onepage&q&f=false

13. Davis, L. E., Martini, J., & Cragin, K. (2017, January 31). Countering ISIL as a transregional threat. p.13, RAND Corporation. Retrieved May 4, 2023, from https://www.rand.org/pubs/perspectives/PE228.html

14. Deutsch, A. (2017, August 17). How Syria continued to gas its people as the world looked on. Reuters. https://www.reuters.com/investigates/special-report/mideast-crisis-syria-chemicalweapons/

15. Eksi, M. (2017, October). The Syria Crisis as a Proxy War and the Return of the Realist Great Power Politics. Hybrid Warfare Special Issue. 1 (2), 106-129. Retrieved May 2, 2023, from https://www.researchgate.net/publication/329029586_THE_SYRIAN_CRISIS_AS_A_PROXY_WAR_AND_THE_RETURN_OF_THE_REALIST_GREAT_POWER_POLITICS

16. Elliot, R., & Timulak, L. (2021). Why a Generic Approach to Descriptive-Interpretive Qualitative Research? In Essentials of descriptive-interpretive qualitative research: A generic approach (pp. 3–14). American Psychological Association. Retrieved May

2, 2023, from https://www.apa.org/pubs/books/essentials-descriptive-interpretive-qualitative-research-sample-chapter.pdf

17. Ellison, D. (2016, April 15). FPI Bulletin: Saudi Arabia and the Syrian Civil War. pp. 1-2, Foreign Policy Initiative. Retrieved May 2, 2023, from http://www.jstor.org/stable/resrep07388

18. Emile Hokayem (2014) Iran, the Gulf States and the Syrian Civil War, Survival, 56:6, pp. 59-86, DOI: 10.1080/00396338.2014.985438

19. Fares, Q. (2014, May 8). The Syrian Constitution: Assad's Magic Wand - Carnegie middle east ... Malcolm H. Kerr Carnegie Middle East Center . Retrieved April 25, 2023, from https://carnegie-mec.org/diwan/55541

20. Fox, A. (2020). Five Models of Strategic Relationship in Proxy War. Georgetown Strategic Studies Review Journal. DOI:10.13140/RG.2.2.28382.25925

21. Gibbons-neff, T. (2018, May 24). How a 4-hour battle between Russian mercenaries and U.S. commandos unfolded in Syria. The New York Times. Retrieved May 26, 2023, from https://www.nytimes.com/2018/05/24/world/middleeast/american-commandos-russian-mercenaries-syria.html

22. Grant A. & Kaussler B. (2020) The battle of Aleppo: external patrons and the victimization of civilians in civil war, Small Wars & Insurgencies, 31:1, 1-33, DOI:10.1080/09592318.2020.1672959

23. Tamm H. (2014): The Costs and Benefits of Intervention by Proxy, Journal of Intervention and Statebuilding, DOI: 10.1080/17502977.2014.964456

24. Jackson, R. (2011) Culture, identity, and hegemony: Continuity and (the lack of) change in US counterterrorism policy from Bush to Obama. Int Polit 48, 390–411. https://doi.org/10.1057/ip.2011.5

25. Jenkins, B. M. (2014). The dynamics of Syria's Civil War. pp 7-9. RAND Corporation. Retrieved May 15, 2023, from https://www.rand.org/content/dam/rand/pubs/perspectives/PE100/PE115/RAND_PE115.pdf.

26. Kofman, M., & Rojansky, M. (2018, January 24). What kind of victory for Russia in Syria?. Army University Press. Retrieved May 6, 2023, from https://www.armyupress.army.mil/Journals/Military-Review/Online-Exclusive/2018-OLE/Russia-in-Syria/

27. Loveman C. (2002) Assessing the phenomenon of proxy intervention, Conflict, Security & Development, 2:03, 29-48, DOI: 10.1080/1467880020059061

28. Lund, A. (2019). From Cold War to Civil War: 75 Years of Russian-Syrian Relations. p13. Swedish institute of international affairs. Retrieved May 2, 2023, from https://www.ui.se/globalassets/ui.se-eng/publications/ui-publications/2019/ui-paper-no.-7-2019.pdf

29. MacAskill, E., & Borger, J. (2004, September 16). Iraq war was illegal and breached UN Charter, says Annan. The Guardian. Retrieved May 1, 2023, from https://www.theguardian.com/world/2004/sep/16/iraq.iraq

30. MacMillan J. (2019) After Interventionism: A Typology of United States Strategies, Diplomacy & Statecraft, 30:3, 576-601, DOI: 10.1080/09592296.2019.1641927

31. Manna, H. (2012, June 22). Syria's opposition has been led astray by violence . The Guardian. Retrieved May 4, 2023, from https://www.theguardian.com/commentisfree/2012/jun/22/syria-opposition-led-astray-by-violence

32. Marshall A. (2016) From civil war to proxy war: past history and current dilemmas, Small Wars & Insurgencies, 27:2, 183-195, DOI: 10.1080/09592318.2015.1129172

33. Meiser, J. W. (2018, August 5). Introducing liberalism in international relations theory. E-International Relations. Retrieved May 4, 2023, from https://www.e-ir.info/2018/02/18/introducing-liberalism-in-international-relations-theory/

34. Mengshu, Z. (2020, May 22). A brief overview of Alexander Wendt's constructivism. E-International relations. Retrieved from https://www.e-ir.info/2020/05/19/a-brief-overview-of-alexander-wendts-constructivism/

35. Mumford A. (2013) Proxy Warfare and the Future of Conflict, The RUSI Journal, 158:2, 40-46, DOI: 10.1080/03071847.2013.787733

36. Mumford, A. (2013). Proxy Warfare (1st ed.). Cambridge: Polity press. Retrieved from https://www.perlego.com/book/1535624/proxy-warfare-pdf

37. Военно-техническое сотрудничество России и Сирии [Military-technical cooperation between Russia and Syria.]

TASS. (2015, September 30). Retrieved May 2, 2023, from https://tass.ru/info/2305654

38. Hinnebusch, R. (2019). What Went Wrong: Understanding the Trajectory of Syria's Conflict. pp. 29-52 In: Matar, L., Kadri, A. (eds) Syria: From National Independence to Proxy War. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-319-98458-2_2

39. Obama, B. (2013, September 10). Remarks by the president in address to the nation on Syria. National Archives and Records Administration. Retrieved May 1, 2023, from https://obamawhitehouse.archives.gov/the-press-office/2013/09/10/remarks-president-address-nation-syria

40. Oxnevad I. (2020). Beyond a Desert Revolt: TE Lawrence's Theory of Proxy War and State Creation, Studies in Conflict & Terrorism, DOI: 10.1080/1057610X.2020.1723283

41. Petkova, M. (2020, October 1). What has Russia gained from five years of fighting in Syria? Features | Al Jazeera. Retrieved May 4, 2023, from https://www.aljazeera.com/features/2020/10/1/what-has-russia-gained-from-five-years-of-fighting-in-syria

42. Price, N. (2022, August 21). Ninth anniversary of the Ghouta, Syria Chemical Weapons Attack - United States Department of State. U.S. Department of State. https://www.state.gov/ninth-anniversary-of-the-ghouta-syria-chemical-weapons-attack/#:~:text=Nine%20years%20ago%2C%20early%20in,people%20%E2%80%94%20many%20of%20them%20children.

43. Rauta V. (2020). Proxy Warfare and the Future of Conflict: Take Two, The RUSI Journal, 1-11, DOI: 10.1080/03071847.2020.1736437

44. Rauta V. (2020). Framers, founders, and reformers: Three generations of proxy war research, Contemporary Security Policy, 1-23, DOI: 10.1080/13523260.2020.1800240

45. Rauta V. (2021) 'Proxy War' - A Reconceptualisation, Civil Wars, 23:1, 1-24, DOI: 10.1080/13698249.2021.1860578

46. Rondeaux, C., & Sterman, D. (2019, February). Twenty-first century proxy warfare: Confronting strategic innovation in a multipolar world. New America. https://www.newamerica.org/international-security/reports/twenty-first-century-proxy-warfare-confronting-strategic-innovation-multipolar-world/

47. Ismael, T. (1989). Asad: The Struggle for the Middle East. Patrick Seale Berkeley: University of California Press, 1988, p. 552. Canadian Journal of Political Science/Revue Canadienne De Science Politique, 22(4), 889-891. doi:10.1017/S0008423900020588

48. Seale, P., & McConville, Maureen. (1989). Asad of Syria : The struggle for the Middle East / Patrick Seale ; with the assistance of Maureen McConville. Berkeley: University of California Press.

49. Sell, T. M. (2012). Theories of International Relations. In A Primer on Politics (pp. 272–280). Creative Commons. Retrieved May 18, 2023, from https://2012books.lardbucket.org/pdfs/a-primer-on-politics.pdf

50. Siccardi, F. (2021, September 14). How Syria changed Turkey's foreign policy - Carnegie Europe. Carnegie Europe. Retrieved May 4, 2023, from https://carnegieeurope.eu/2021/09/14/how-syria-changed-turkey-s-foreign-policy-pub-85301

51. Shaheen, K., & Letsch, C. (2015, July 20). 'Isis Suicide Bomber' strikes Turkish border town as Syrian war spills over. The Guardian. Retrieved May 4, 2023, from https://www.theguardian.com/world/2015/jul/20/explosion-hits-turkish-town-near-syrian-border

52. Strobel, W., & Karouny, M. (2013, September 14). U.S., Russia agree on Syria weapons, Obama says force still option. Reuters. https://www.reuters.com/article/us-syria-crisis-idUSBRE98A15720130914

53. Trenin, D. (2016). Russia In The Middle East: Moscow'S Objectives, Priorities, And Policy Drivers. p.2. Carnegie Endowment for International Peace. Retrieved May 2, 2023, from https://carnegieendowment.org/files/03-25-16_Trenin_Middle_East_Moscow_clean.pdf

54. Theys, S. (2018, August 5). Introducing constructivism in international relations theory. E-International relations. Retrieved May 22, 2023, from https://www.e-ir.info/2018/02/23/introducing-constructivism-in-international-relations-theory/

55. Uskowi, N. (2018). The Evolving Iranian Strategy in Syria: A Looming Conflict with Israel. pp 2-5. Atlantic Council. http://www.jstor.org/stable/resrep20716

56. Wastnidge, E. (2017), Iran and Syria: An

Enduring Axis. Middle East Policy, 24: 148-159. https://doi.org/10.1111/mepo.12275

57. Weiss, A. S., & Ng, N. (2019). Collision Avoidance: Lessons from US and Russian Operations in Syria (Vol. 20). Washington, DC: Carnegie Endowment for International Peace. Retrieved May 8, 2023, from https://carnegieendowment.org/2019/03/20/collision-avoidance-lessons-of-u.s.-and-russian-operations-in-syria-pub-78571

58. Williams, M. C. (2004). Why Ideas Matter in International Relations: Hans Morgenthau, Classical Realism, and the Moral Construction of Power Politics. International Organization, 58(4), 633–665. http://doi.org/10.1017/S0020818304040202

59. Yazıcı, H. (2018). Proxy wars in Syria and a new balance of power on the Middle East. Journal of Management and Economics Research, 16 (3), 1-10. DOI: 10.11611/yead.449260

60. Yoon, M. Y. (1997). Explaining U.S. Intervention in Third World Internal Wars, 1945-1989. Journal of Conflict Resolution, 41(4), 580–602. Retrieved May 5, 2023, from https://doi.org/10.1177/0022002797041004005

61. Yolcu, F. H. (2016, November). Iran's Involvement with Syrian Civil War: Background, Reasons and Alternatives. Bilgi (33), 35-64 Retrieved May 5, 2023, from https://www.researchgate.net/publication/313807107_Iran's_Involvement_with_Syrian_Civil_War_Background_Reasons_and_Alternatives

62. Zisser, E. (2004). Between continuity and change. In Bashar, al-Asad, and his regime (2nd ed., Vol. 45, pp. 239–255), Orient.

63. Zintl, T. (2015). The Cooptation of Foreign-Educated Syrians: Between Legitimizing Strategy and Domestic Reforms. In R. Hinnebusch & T. Zintl (Eds.), Syria from Reform to Revolt: Volume 1: Political Economy and International Relations (pp. 113–132). Syracuse University Press. http://www.jstor.org/stable/j.ctt1j2n833.9

ISE MNU Student Research Review №2