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Oil price, stock market, foreign direct investment and the economy: Case of Kazakhstan

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Abstract
The study aims to investigate whether there is a correlation between economic variables in Kazakhstan with stock market index, oil price and foreign direct investment. Additionally, previously written literature on the relationship between above mentioned variables is carefully explained. Conceptual framework helps to analyze theoretical comprehension of a subject. A regression analysis is employed in the study. The robust economic growth quickly can give a way to a recession not only in advanced countries but also in emerging economies. Both developed and emerging countries are impacted by oil price, yet both of them are impacted differently. The purpose of this study is to investigate whether there is any relationship between economy and oil price, foreign direct investment and stock market index in Kazakhstan. The study employed Ordinary Least Squares technique. The data was obtained from the National Statistics Agency of the Republic of Kazakhstan, National bank of Kazakhstan and Bloomberg agency. The study found out that all of the employed variables do positively affect GDP. The dependence on oil price in the long term can be considered as a problem of Dutch disease. The obtained results can be used in the economic policy of Kazakhstan, as well as a theoretical basis for further studies.

Keywords: oil price, economy, GDP, stock market index, foreign direct investment, Kazakhstan

1. Introduction
The modern history of Kazakhstan counts no more than 30 years. However, there are certain results that require well-timed assessments. Today, we can confidently state that Kazakhstan has managed to occupy a worthy place in the world community and became an equal partner in solving regional and global economic and political issues. It became possible not only to ensure security and territorial integrity, but also to achieve high rates of economic growth. In this regard, it seems appropriate to analyze the main macroeconomic parameters such as Gross Domestic Product.
The share of exports of goods and services from Kazakhstan over the past 20 years has more than doubled. There are three reasons to explain this fact. First of all, the creation of a favorable investment climate has contributed to significant volumes of foreign direct investment inflows. Secondly, the favorable conjuncture of the world markets for hydrocarbons contributes to increasing the export potential of the country. Thirdly, an increase in the share of Kazakhstan's exports of goods and services over the past twenty years in the global indicator. At the beginning of the 21st century, extremely favorable conditions have been established in Kazakhstan: production is reviving, the economy is moving into a mode of sustainable growth. In 2000-2007, cumulative Gross Domestic Product growth rate in Kazakhstan achieved 81.3%. A distinctive feature of that period was an acceleration of economic growth with a positive impact of exogenous and endogenous factors. However, following the global financial crisis in 2008, Gross Domestic Product of Kazakhstan started to decline achieving its lowest growth of 2.4% in 2015.
During 2000-2007, the average annual rate of growth in industrial production was 14.9% compared to negative growth in the 1990s (–15.7%) and low growth rate in 2015 (2.4%). As a result, the production of goods for the domestic market increased significantly.
Despite the global financial and economic crisis, Kazakhstan managed to maintain a positive dynamic growth of the national economy. According to preliminary data of the Statistics Committee of the Ministry of National Economy of the Republic, the short-term economic indicator for 2017 was around 5.2%.

2. Literature Review
The oil price shocks of the 1970s are often cited as the stirrers responsible for the stagflation occurred in many industrial countries in that decade. In his paper, Benjamin Hunt (2006) [15] employed the IMF's new Global Economic Model (GEM) to examine the validity of such claims. Unlike some of the other macroeconomic models used previously to consider this question, GEM is a structural model based fully on a choice theoretic framework. To some extent, the significant oil price appreciation during 2007-08 was an unavoidable consequence of booming demand and stagnant production.
Increasing oil prices appear to slow down aggregate U.S. economic activity by more than decreasing oil prices stimulate it. Previous researches suggest that such variables as adjustment costs, financial stress, and/or monetary policy may be possible explanations for the asymmetric response. Nathan S. Balke, Stephen P.A. Brown and Mine K. Yücel (2002) [3] employed a near vector autoregressive model of the U.S. economy to study where the asymmetry might originate. Carlos de Miguel, Baltasar Manzano and José Ma Martin-Moreno (2003) [8] studied the effects of oil price shocks on the characteristics of the business cycle and on welfare in a small

open economy, such as the Spanish economy. The study has found significant evidence of nonlinearities for both aggregate and disaggregate indices. The research highlights the significance of nominal prices and extreme events such as the Great Recession in the transmission of nonlinearities. The results of the research show that nonlinear impacts of the price of oil on the aggregate economy vary according to time period even within the post-1974 data. Starting from 2000, oil price volatility went up markedly. Javier F. Mory (1993) [2] introduced some evidence of an asymmetric effect of oil price spikes upon the U.S. economy. Oil price increases seem to affect the economy in a negative fashion, while oil price decreases do not show substantial favorable or detrimental effects.

There are several theoretical reasons to expect that oil price decreases are not significantly beneficial to the economy in short-run. They do increase disposable income in oil-importing countries, but they also create unemployment in oil-producing regions and dislocate the relative composition of demand and international trade. Under these circumstances, it would be advisable to avoid fluctuations in the price of oil as much as possible, as their net effect is always negative – price decreases may not compensate for the damages produced by previous price increases.

Shu-Yi Liao, Sheng-Tung Chen and Mao-Lung Huang (2016) [20] applied Markov-switching method in order to identify bear and bull markets regimes and adopts interactive double-dummy variable approach to re-investigate the conditional relationship between the real oil price return and the international real stock return in 15 OECD countries. The sample is divided into bear markets and bull markets. The empirical results indicate that, once the stock index is in the bull trend, an increase in oil price cannot affect the real stock return, while a decrease in oil price can lead to higher stock returns.

Nicholas Ruei-Lin Lee, Ming-Min Lo, Hsiang-Hui Chu and Hsiang-Jane Su (2015) investigated threshold co-integration and dynamics of Shanghai stock index and Brent crude oil in the framework of a threshold vector error correction model (TVECM). Authors conducted a test for the null of no co-integration in the context of the threshold co-integration model. This testing problem is quite complicated as the null hypothesis implies that the threshold variable (the co-integrating error) is non-stationary. Two regimes are implied by the model and divided into the usual and unusual regimes. The findings of the study show that while conventional methods fail to detect significant dynamics between price increases in Chinese stock index and Brent crude oil index in the usual and unusual regimes.

Musibau Adetunji Babatunde, Olayinka Adenikinju and Adeola F. Adenikinju (2013) focused on the relationships between the oil price and the Nigerian stock market between 1995 and 2008. Andre Mollick and Khoa H. Nguyen (2015) [21] explain from 19% to 43% of the variation in stock returns of nine major U.S. oil companies, using the price of oil, the value of the USD and the term spread of U.S. yield curve.

Ahmed Almohaimeed and Nizar Harrathi (2013) [1] investigated the volatility transmission effects and conditional correlations between oil price and Saudi stock market and sector stock indexes using VAR-BEKK specification for daily dataset covering the period from January 3, 2009 to March 21, 2012. The study revealed a bidirectional volatility transmission between oil price and stock market. The results indicate that oil price has a negative volatility spillovers effect on stock market, while the stock market has a negative shock effect and positive volatility effect on oil prices. Concerning the volatility transmission effect between oil price and sector stock returns, the findings show that only oil prices volatility affect sector stock returns. The authors conclude that oil price has a negative volatility spillovers effect on sector stock returns.

Jochen Gunter (2014) [12] adopted the structural VAR to analyze the effects of structural oil supply and demand shocks on national stock markets for a sample of OECD members, containing both net oil importers and net oil exporters. The research conducted by Lakshmi Kalyanaraman (2014) [19] thoroughly investigates the associations between oil prices and stock prices in Saudi Arabia. Since Saudi Arabia is the world's largest producer of oil; it is obviously expected that the country's stock market is affected by oil price fluctuations. Author tested the relationship between stock price and oil price by applying the classic and a residual based test of co-integration. The classic co-integration test failed to detect the co-integration between the two variables. However, the residual based test demon started that the two variables are co-integrated. The relationship between oil price and stock price in Saudi Arabia is found to be statistically significant and positive. Kalyanaraman (2014) [19] expected that the oil price increase should have a positive relationship with the stock prices in case of an oil exporting country. Rise in oil price increases the income and wealth for the oil exporting country which is bound to have a positive impact on the level of economic activity of the country. The results of above mentioned study present important information for the policy makers of Saudi Arabia. Katrakilidis Constantinos, Lake Andreas Ektor and Mardas Dimitrios (2010) [7] examined the dynamic linkages between the Greek stock market returns and the oil price behavior. They explored the interactions between stock market returns, the volatility of the stock market index, the oil returns and the oil price index volatility. Authors employed a VAR model in conjunction with Granger-causality tests. The findings support the existence of significant positive association between stock market and oil market. With regard to the detection of Granger causal effects, the article presents evidence of strong bi-directional causality between stock market returns and stock market volatility. Mongi Arfaoui and Aymen Ben Rejeb (2017) [2] mentioned the issue of interdependencies between all markets using the simultaneous equation approach for the period between 1995 and 2015. Authors found that oil price is significantly affected by stock markets, gold and USD. Korhan K. Gokmenoglua and Negar Fazlollahia (2015) [11] examined the long-run relationship between oil price, gold price, gold price volatility index and oil price volatility index on U.S. S&P500 stock market price index. While all the variables have long-run impact on S&P500 stock market price index, the gold price has the highest impact on the stock price in long-run and short-run; which has important implications for investors. The study conducted by Wensheng Kang, Ronald A. Ratti and Kyung Hwan Yoon (2015) investigated the effects of global

oil price shocks on the stock market return and volatility.

3. Methodology

It is universally accepted that Kazakhstan possesses extensive natural resources and relies heavily on revenues from the export of primary commodities, in particular, petroleum and natural gas. According to the International Monetary Fund Report, starting since the early 2000 the Kazakhstani economy was growing rapidly with the average growth rate of 9% annually. The most of this growth is attributed to the export of petroleum and natural gas. While there is a literature on the relationship between oil price and stock price, and a separate literature on the relationship between oil price and exchange rate, the relationship between these two streams, however, has not been that closely studied, especially within the context of emerging market stock prices (Basher, Haug & Sadorsky, 2011) [4].

This research attempts to investigate whether there is a correlation among oil price, foreign direct investment, stock market and the economy in Kazakhstan. This study used data collected from the National Statistics Agency of the Republic of Kazakhstan and the data obtained from the Bloomberg. Table I below demonstrates macroeconomic trend (%) in Republic of Kazakhstan.

Table 1: Macroeconomic trend (in %)

	2003	2007	2011	2015
GDP growth	9.50	9.10	8.50	2.40
Industrial production	10	10.6	9.2	2.4
Inflation	6	6.90	9.8	13
Unemployment	8.80	8.1	7.30	6.60

This study empirically explores the relationship between oil price, foreign direct investment, stock market index and the economy in Kazakhstan. The specific objective of this study is to investigate whether there is any relationship between Gross Domestic Product and above mentioned variables. The data between 2000 and 2018 was employed in the study. Annual observations are compiled in aggregate form during 2000 – 2018, Gross Domestic Product in level and Brent Oil Price during 2000 – 2018, as well as foreign direct investment and KASE index during the same period of time. These observations were transformed to assure the stationarity of the data set. The data is initially entered in log form to reduce the impact of heteroscadasticity, and then taken as the first difference between the current and one lagged observations to remove time trend in the data. Additionally, some data sets are further differentiated in order to eliminate seasonal trends. Nasseh and Strauss (2000) mentioned that taking logs and differences was an important step in order to obtain stationary time series. The authors mentioned that it helps to avoid the complications associated with unit roots and spurious regressions. The research employs a unit root test as a mandatory procedure to check for stationarity.

There are no previous studies on this issue in Kazakhstan. The study attempts to prove that there is a significant dependence of Kazakhstani economy on oil price, foreign direct investment and stock market index. This study employs such variables as Gross Domestic Product, Foreign Direct Investment, and KASE index and oil price. The macroeconomic variables include Gross Domestic Product only. Stock market index indicator is KASE index, which includes representative list of Kazakhstani companies. The main idea of this study is to find correlation between Gross Domestic Product in Kazakhstan and oil price, stock market development indicator and foreign direct investment. The main methodology includes Ordinary Least Squares.

The results of unit root test are provided below. The results show that data suffers from being non stationary in levels but is stationary in the first difference. Therefore, mostly differenced data is reliable for the study.

Two standard procedures of unit root test namely the Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) tests are employed. The results are demonstrated below.

Table 2: Unit Root Test (Industrial Production Index & Consumer Price Index)

Unit root and stationarity	ADF (1%)	ADF (5%)	PP (1%)	PP (5%)
Critical values	-3.48	-2.88	-3.48	-2.88
Oil price	1.19		1.18	
Gross Domestic Product	-1.22		-1.24	
KASE index	1.27		1.28	
Foreign direct investment	1.34		1.36	

As it was mentioned previously, it was necessary to make the data ready for further research. It can be observed from the Table 2, that according to the ADF and PP models, the study fails to reject the null hypothesis, which means that the data is stationary.

Table 3: Unit Root Test (Industrial Production Index & Consumer Price Index)

Unit root test	ADF (1%)	ADF (5%)	PP (1%)	PP (5%)
Critical values	- 3.48	-2.88	-3,48	-2,88
Oil price	-6.89		-6.92	
Gross Domestic Product	-9.98		-9.86	
KASE index	-10.27		-10.29	
Foreign direct investment	10.43		10.45	

All variables were seasonally adjusted. Time series of macro variables and oil price were transformed into log values. The regression was conducted and results are demonstrated further.

$$GDP\ t = \beta_0 + \beta_1 FDI_{t-1} + \beta_2 OP_{t-1} + \beta_3 KASE\ Index_{t-1} + u_t \quad (1)$$

Where

GDP_{t-1} - Gross Domestic Product

FDI_{t-1} - Foreign direct investment

OP_{t-1} – Oil price

$KASE\ Index_{t-1}$ – KASE Index

u_t - stochastic error term.

The main regression analysis was implemented and ordinary least squares technique was employed for the period of time of 2000-2018 and 2008-2018. The results demonstrate significant reliance of GDP on oil price in Kazakhstan. The results of the period between 2008-2018 demonstate strong and significant

dependence of the economy on oil price at the level of significance of 1 percent. Foreign direct investment has strong impact on the economy in both regressions. However, KASE Index demonstrated positive but not significant relationship with Gross Domestic Product in Kazakhstan.

Table 4: Regression analysis

Dependent variable: Gross Domestic Product	Full sample	
	2000-2018	2008-2018
FDI	0.22*** (0.001)	0.31*** (0.001)
Oil price	0.41** (0.023)	0.52*** (0.001)
KASE Index	0.11*** (0.001)	0.13*** (0.001)
Observations	18	11
Wald test	489	522

4. Conclusıon

The major results of this research paper are summarized next. First, we find strong degree of correlation between oil price and Gross Domestic Product in Kazakhstan. Secondly, foreign direct investment does positively affect Gross Domestic Product in Kazakhstan. Thirdly, KASE index does insignificantly affect Gross Domestic Product in Kazakhstan, which can be explained by the fact that it is not representative enough and includes only few companies. This study successfully investigated the interaction between the oil price and the economy in Kazakhstan. Also, the study employed such variables as oil price, Gross Domestic Product, Foreign Direct Investment, KASE Index.The study applies Ordinary Least Squares technique. The data was collected from National Statistics Agency of the Republic of Kazakhstan and from the Bloomberg as well. The results of the study confirm strong and significant correlation between oil price and the economy in Kazakhstan. Moreover, foreign direct investment positively affects the economy in Kazakhstan. It should be stated that Kazakhstani economy is vulnerable to Dutch disease. Rising oil prices would negatively affect Kazakhstani economy in the long run by making it more vulnerable to Dutch disease. Foreign direct investment may positively influence the economy of Kazakhstan in the long run. The study can serve as a promising avenue for further research. New variables possibly can be employed or the same study can take place in emerging as well as in developed countries. The practical implication is the fact that foreign direct investment may serve as a key to economic growth and the development of Kazakhstan. It may possibly help an emerging economy to become developed if certain industries and spheres are taken into consideration. Reliance on oil price may negatively impact Kazakhstani economy in the long run. The limitation of the study is that only 18-year period was taken into consideration in the study.

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