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Article

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International Journal of Energy Economics and Policy

International Journal of Energy Economics and Policy

ISSN: 2146-4553

available at http: www.econjournals.com

International Journal of Energy Economics and Policy, 2023, 13(1), 395-402.

A Comparison of the Returns of Oil and Energy Companies Quoted in Kase and the Returns of the Kase Index, Exchange Rate, and Selected International Energy Indices

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Received: 25 October 2022 **Accepted:** 07 January 2023 **DOI:** https://doi.org/10.32479/ijeep.13881

ABSTRACT

The positive steps taken since the beginning of the 2000s have brought Kazakhstan's economy ahead of its peers. Making this economic growth sustainable depends on the correct determination of the interaction between economic instruments. Therefore, we aim to determine the relationship between the returns of oil and energy companies traded on the Kazakhstan Stock Exchange (KASE) and the returns of the KASE index, exchange rate, and selected international energy indices. The data were analyzed using the VAR method. Our analysis showed that the two-period lagged value of the KZTO variable, the one-period lagged return of the KASE index in the KZAP variable, the two-period lagged return of the dollar exchange rate and the two-period lagged return of the KZAP in the KEGC variable have positive effects. On the other hand, one-period lagged return of the FTSE CNBC Asia 100 Oil and Gas index, one-period, and two-period lagged return of the ruble return, and one-period lagged return of the Dow Jones Islamic Markets Oil and Gas index were found to have negative effects.

Keywords: Kazakhstan, KASE, Oil, Energy, Exchange Rate, Energy Indices, VAR Analysis
JEL Classifications: C13, C20, C22

1. INTRODUCTION

In this study, the relationship between the returns of oil and energy companies traded on the stock exchange in Kazakhstan and the returns of the Kazakhstan Stock Exchange (KASE) index, the exchange rate, and selected international energy indices are analyzed using the VAR method. Kazakhstan gained its independence in 1991 with the disintegration of the USSR, experienced a rapid restructuring process, and increased the welfare of its people, like the other former USSR countries. In the transition period, the economic stagnation in Kazakhstan gradually ended in 2000 and the economy started to rise rapidly. Both Kazakhstan's natural resources (it possesses about 3% of the world's total oil reserves, about 1.1% of natural gas reserves, and about 3.3% of coal reserves), as well as the positive steps of Kazakhstan's managers, have improved the economy of Kazakhstan (Mudarissov and Lee, 2014; Xiong et al., 2015; Myrzabekkyzy et al., 2022; Bolganbayev et al., 2022). This rapid growth has brought Kazakhstan to the second rank among the former USSR countries in terms of economic growth (Mukhtarov et al., 2020). However, fluctuations in world markets, especially oil prices, also contributed to this (Kelesbayev et al., 2022).

On November 17, 1993, the Kazakhstan Stock Exchange (KASE) was established with the participation of 23 leading Kazakh banks under the leadership of the National Bank of the Republic of

Kazakhstan. The National Bank of Kazakhstan owns 50.1% of its shares and is its largest shareholder. Regulation of the national currency market in Kazakhstan is listed among the main mandates of KASE. Stocks traded in KASE differ from stocks in developed countries with their high returns and volatility, just like in other developing countries (Bekaert and Harvey, 1997). For example, while the KASE index lost value by 44% in 2015, it became the most profitable stock market among developing countries in 2016 (Syzdykova, 2018).

The study period was determined as between 01 January 2021 and 07 November 2022 and the data were obtained from the investing.com website (Access Date: 09.11.2022).

2. LITERATURE REVIEW

Although there are many studies in the literature on different dimensions of the Kazakhstan economy due to its importance, studies on KASE and stocks traded in KASE, especially oil and energy companies, are limited.

Oskenbayev et al. (2011) studied macroeconomic indicators' effect on Kazakhstan's stock market performance. They analyzed the long- and short-term relationships between the main macroeconomic variables (industrial production index, inflation rate, exchange rate, long and short-term bank loans, oil price volatility, and trade volume) and the KASE index for the period 2001-2009. They found a cointegration between the series, indicating a violation of the market efficiency hypothesis. They used the Johansen Cointegration test, Engle-Granger two-stage approach, and the Granger causality test. They found that the main determinants of the KASE index are per capita income, inflation, exchange rate, and the dummy variable representing the impact of the worldwide crisis. They found that another variable affecting the index is oil price volatility, which causes unexpected earnings effects as a result of rapid but temporary increases in oil prices.

In his study titled "The effect of oil price shocks on CIS stock markets: Russia, Kazakhstan, and Ukraine", Yalçın (2015) analyzed the effect of oil price increases caused by supply or demand shocks on the stock markets of Russia, Kazakhstan, and Ukraine, which are members of the Commonwealth of Independent States (CIS), for the period 2000:01-2013:07, using the structural SVAR model. He found that KASE, MICEX, and PFTS indexes reacted differently to oil price shocks and that their responses diverged further in the pre-and post-2008 crisis.

Syzdykova (2017) discussed the effect of oil prices on the KASE between January 2000 and March 2017 in the article titled "The Impact of Oil Prices on the Stock Market: The Case of Kazakhstan". The Johansen cointegration test showed that there is a long-term relationship between the variables The Granger causality test showed that there is a unidirectional relationship between oil prices and stock returns. His findings were consistent with the expectations.

Syzdykova (2018), in the article titled "Macroeconomic Variables and Stock Market Relationship: Example of KASE", attempted to explain the relationship between five macroeconomic variables (inflation rate, interest rate, exchange rate, industrial production index) and the KASE index. The least squares (LCS) analysis showed that the changes in the variables of interest rate, industrial production index, exchange rate, CPI, and oil prices explain the Kazakhstan stock market by 62%, that the oil price and exchange rate variables are statistically significant and affect the stock market negatively, and lastly, a 1% increase in the exchange rate decreased the stock market by 1.72%, while a 1% increase in oil prices decreased it by 1.14%.

Aldıbekova (2018), in his doctoral thesis on the Effects of Oil Prices on the Economy of Kazakhstan, attempted to reveal the trends in the world oil market and the effects of oil price fluctuations on the world economy, especially on Kazakhstan's macroeconomic indicators.

Syzdykova (2019), in his doctoral thesis, examined the effects of oil prices on the stock markets of developed and developing countries using panel data analysis and comparatively analyzed the relationship between the stock market index and oil price changes in 23 developed and developing countries for the period January 2010-August 2018. The variables included in the model are Brent crude oil prices, country stock indexes, and major macroeconomic variables such as inflation, industrial production index, real effective exchange rate, and short-term interest rate.

Gnahe (2020) analyzed the effects of macroeconomic variables on stock market returns in Kazakhstan and used quarterly data of the KASE index, gross domestic product, interest rate, inflation rate, exchange rate, and foreign direct investment for the period 2000 to 2019. Using the Vector Error Correlation Model (VECM) and the Johansen cointegration test, it has been determined that low inflation has a positive effect on stock market returns, while high-interest rates have a negative effect. He also observed a negative relationship between exchange rates and stock market returns.

Gazel et al. (2022) analyzed the macroeconomic factors affecting the stock market returns in the stock market indices of Eurasian countries and the relationship between the stock market index of Russia, Turkey, Kazakhstan, and Ukraine and selected macroeconomic variables. They used quarterly data covering the years 2009-2021 and analyzed the relationships between countries' stock market indices and selected macroeconomic variables such as GDP growth rate, inflation, exchange rate, import, export, and interest rate using the panel regression model. They found that the stock market indices in Russia, Turkey, Kazakhstan, and Ukraine are mainly determined by the growth rate, and the growth rate has a positive and significant effect. They found that increases in imports, exports, and exchange rates had a negative and significant effect on index returns.

3. METHOD AND ANALYSIS

In this study, we analyzed the variables that affect the returns of energy and oil companies traded on the KASE. First of all, the daily return of the KASE index and the daily returns of the Dollar-Ruble exchange rates in Kazakhstan are included. Secondly, the daily returns of four indices, which are closely related to Kazakhstan companies among the oil and energy indices in the international markets, are included. The coding and explanations of the variables are given in Table 1. The impacts of all seven indices are examined for each of the three energy and oil companies traded on KASE.

The general status of the variables is summarized using the descriptive statistics (Table 2) and the time path graph (Graph 1). Average statistics show that the average daily returns of the Y01 and K03 variables are negative, while the average daily returns of the other variables are positive. The time path graph, on the other hand, shows that the daily returns of the variables are generally around the mean.

The initial step of the VAR analysis is to determine the stationarity levels of the variables. The variable stationarities are determined via the ADF (Augmented Dickey-Fuller) test and the findings are given in Table 3. ADF is one of the widely used methods to determine the stationarity of time series. The test statistic gives the following equality:

Table 1: Research variables

Variable code	Explanation
X01	Dow Jones Islamic Markets Oil and Gas Index
X02	Dow Jones Global ex-US Oil and Gas Index
X03	FTSE CNBC Asia 100 Oil and Gas Index
X04	STXE Oil and Gas NR Index
K01	KASE Index
K02	RUB/KZT (RUBLE) Exchange Rate Index
K03	USD/KZT (USD) Exchange Rate Index
Y01	KZTO Yield
Y02	KZAP Yield
Y03	KEGC Yield

$$\Delta Y_t = \beta_0 + \beta_1 t + \delta Y_{t-1} + \alpha_i \sum_{i=1}^{m} \Delta Y_{t-i} + \varepsilon_t \qquad (1)$$

In the ADF test, if the null hypothesis is rejected for k= 0, 1, 2, 3. values, the series is considered stationary for the relevant level (Sevüktekin, 2007). The ADF test showed that all of the examined variables were stationary. Thus, the return values were used in the VAR model without any difference.

3.1. Vector Autoregression (VAR) Model

The vector autoregressive (VAR) model, which is the generalized form of the autoregressive models to the multivariate case, was introduced to the econometrics literature by Sims (1980). It can be seen as an alternative to models consisting of simultaneous equations. All variables in the model are dependent variables. Thus, the value of each variable in the observed period is expressed as a linear function of the lagged values both of itself and the lagged values of other variables.

The VAR model has proven to be very useful in explaining and predicting the dynamic structure of economic and financial time series (Yavuz, 2014). It is very useful and easy-to-apply modeling, especially in series with a dynamic structure such as the daily return of a stock.

The mathematical formula of the VAR model is as follows:

$$Y_t = \alpha_1 + \sum_{j=1}^{m} \beta_j Y_{t-j} + \sum_{j=1}^{m} \delta_j X_{t-j} + \varepsilon_{1t} \qquad (2)$$

Graph 1: Line chart of research variables over time

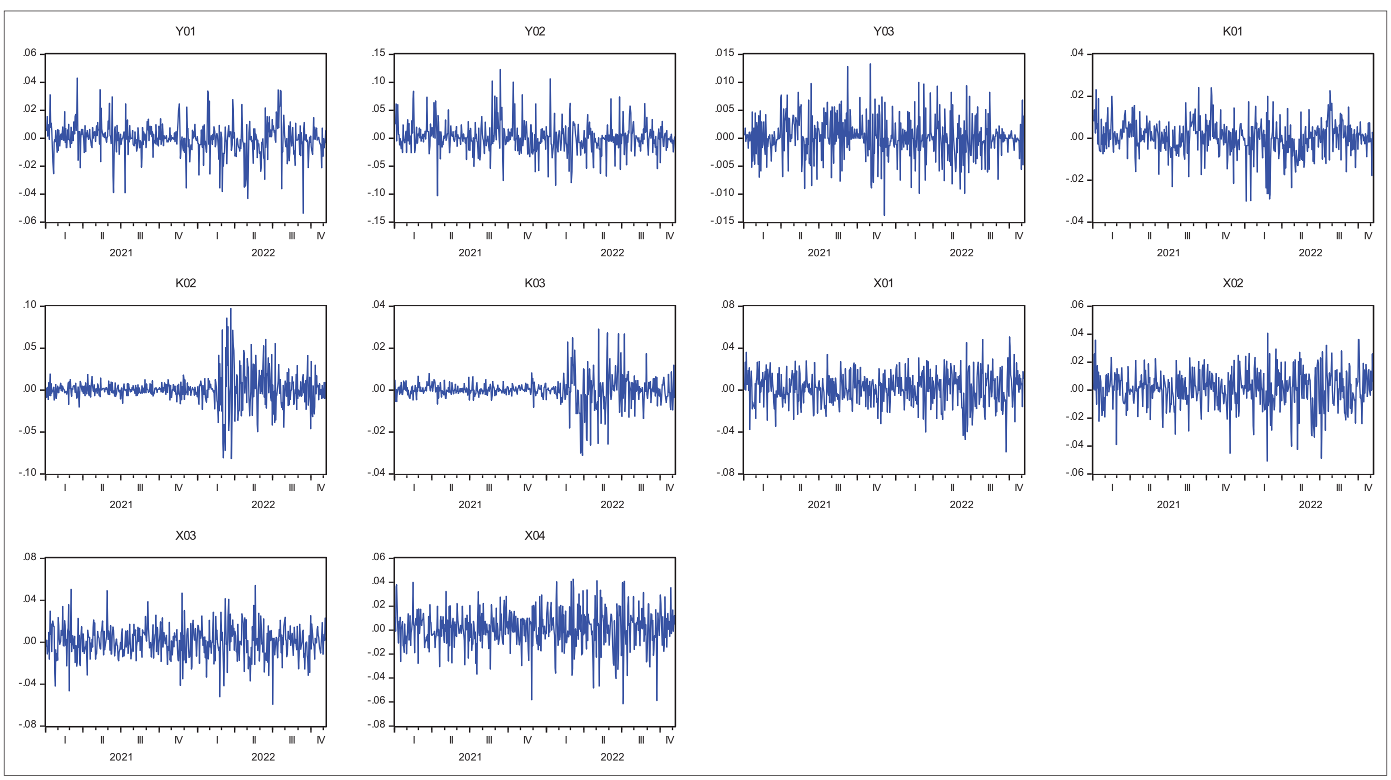


Table 2: Explanatory statistics of research variables

	Minimum	Maximum	Mean	Standard Deviation	Skewness	Kurtosis
X01	–0,059200	0,050600	0,001486	0,015655	–0,242	0,540
X02	–0,050900	0,040700	0,000558	0,013494	–0,429	1,117
X03	–0,059400	0,053900	0,000496	0,015008	–0,067	1,408
X04	–0,061400	0,042700	0,001130	0,015957	–0,365	1,241
K01	–0,030000	0,024200	0,000252	0,008262	–0,427	1,582
K02	–0,081800	0,097200	0,000828	0,018654	0,444	5,817
K03	–0,031200	0,029100	–0,000106	0,006455	–0,172	7,139
Y01	–0,053700	0,042900	–0,000388	0,011441	–0,354	3,313
Y02	–0,103000	0,123000	0,001303	0,026556	0,509	3,209
Y03	–0,013800	0,013300	0,000116	0,003658	–0,018	1,108

$$X_t = \alpha_2 + \sum_{j=1}^{m} \theta_j Y_{t-j} + \sum_{j=1}^{m} \vartheta_j X_{t-j} + \varepsilon_{2t} \tag{3}$$

It can be expressed with a system of equations (Ertek, 2000). As can be seen in the model, lagged values of X affect Y, and lagged values of Y affect X. Although the VAR model is developed to analyze economic series, it has become an important method used in the analysis of a wide variety of series with dynamic structures from economic data to climate data.

To determine the lag length to be used in the VAR model, we performed Sequential modified LR, Final estimation error (FPE), Akaike information criterion (AIC), Schwarz information criterion (SC), and Hannan-Quinn information criterion (HQ) statistics (Table 4). Findings show appropriate lag lengths for SC and HQ as 0, for LR as 8, and FPE and AIC as 2. In this study, we decided to use a lag length of 2, as suggested by the FPE and AIC criteria.

The VAR(2) model was reformulated in line with the decided lag length and the findings are presented in Table 5.

Table 5 shows that both lags of Y01 have a positive effect, while the second lag of the variable X03 has a negative effect. On the other hand, the first lag of K01 and the second lag of K03 has a positive effect on Y02. In Y03, while the second lag of Y01 has a positive effect, the first lags of Y03, K02, and X01 and the second lag of K02 have a negative effect. According to the VAR (2) model R-square values, 7.7% of the variability in the Y01, 7.6% of the variability in the Y02, and 10.1% of the variability in Y03 can be explained with research variables.

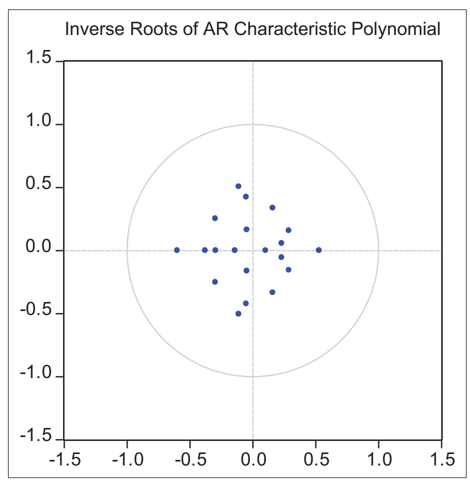
An indicator for the fitness of a model is to determine whether the inverse roots of the AR characteristic Polynomial stay within the unit circle. As seen in Graph 2, all inverses of AR roots of the VAR model were in the unit circle. Therefore, the research VAR model was deemed to be stationary.

The problem of varying variance in the residuals (in error terms) was examined using White's test of variance and whether the residuals fit the normal distribution was examined for each variable using the Jarque-Bera test. Table 6 shows no sign of varying variance and shows the normal distribution.

Table 3: Augmented Dickey-Fuller test findings regarding stationarity of research variables

	Level	
	t- Statistics	P value
X01	–19,7466	0,0000
X02	–19,881	0,0000
X03	–20,64293	0,0000
X04	–18,10312	0,0000
K01	–12,013	0,0000
K02	–13,652	0,0000
K03	–19,9243	0,0000
Y01	–1892570	0,0000
Y02	–19,8986	0,0000
Y03	–28,0152	0,0000
Test critical values:		
1% level	–3,857386	
5% level	–3,040391	
10% level	–2,660551	

Graph 2: Inverse roots of the AR characteristic polynomial



The existence of a serial correlation in the residuals of the VAR(2) model was tested using the Lagrangian multiplier (LM) test and the findings are presented in Table 7. There was no serial correlation in the residuals up to 6 lags.

The causality relationship revealed by the VAR(2) model between the research variables is presented in Table 8. Findings show that X03 is the cause of Y01, K01 is the cause of Y02, and Y02 is the

Table 4: lag length selection criteria for the VAR model

Lag	LogL	LR: sequential modified LR test statistic (each test at 5% level)	FPE: Final Prediction Error	AIC: Akaike Information Criterion	SC: Schwarz Information Criterion	HQ: Hannan-Quinn Information Criterion
0	11931,55	NA	1,95e-32	−50,3103	**−50,24009***	**−50,28270***
1	12045,99	224,5404	1,58e-32	–50,5232	–49,8911	–50,2746
2	12119,26	141,2879	**1,52e-32***	**–50,56228***	–49,3684	–50,0927
3	12159,76	76,72214	1,68e-32	–50,4631	–48,7073	–49,7726
4	12198,92	72,86494	1,86e-32	–50,3583	–48,0407	–49,4468
5	12243,64	81,71223	2,03e-32	–50,277	–47,3975	–49,1445
6	12289,59	82,39999	2,19e-32	–50,2008	–46,7595	–48,8474
7	12350,89	107,8491	2,22e-32	–50,1894	–46,1862	–48,615
8	12407,59	**97,84741***	2,30e-32	–50,1586	–45,5936	–48,3632

*Indicates lag order selected by the criterion (each test at 5% level)

Table 5: Prediction results of the VAR (2) model

	Y01	Y02	Y03	K01	K02	K03	X01	X02	X03	X04
Y01(-1)	**0,112298***	–0,062811	0,008929	0,010430	0,087902	0,003651	–0,179948*	–0,132113*	–0,040129	–0,15235*
Y01(-2)	**0,105147***	0,015078	0,011160	0,026498	–0,031096	0,020597	0,090688	0,143689*	0,084412	0,104741
Y02(-1)	0,009347	–0,009378	0,007371	0,013494	–0,015041	–0,018601	0,039245	0,023488	0,000215	0,069525
Y02(-2)	–0,031235	–0,086132	**0,019731***	–0,017276	0,076852	0,017556	–0,011162	–0,020799	0,006377	–0,003059
Y03(-1)	–0,007022	–0,204175	**–0,248214***	–0,183468*	0,494340*	0,036970	–0,00588	–0,011287	0,232432	–0,072088
Y03(-2)	0,109345	0,220243	0,007410	–0,103491	–0,033074	0,002449	–0,196162	–0,177358	0,230590	–0,160679
K01(-1)	0,019470	**0,388359***	–0,033418	0,008094	0,147749	0,073280	–0,178162	–0,054413	0,088259	–0,122542
K01(-2)	0,134747	0,328929	–0,033434	0,227026*	–0,163218	–0,057108	0,040923	0,091127	–0,004601	–0,014603
K02(-1)	0,000811	–0,110395	**–0,015328***	–0,019377	–0,041694	–0,104209	–0,067928	0,037637	0,071840*	–0,014373
K02(-2)	–0,041197	–0,038588	**–0,018059***	–0,052677*	0,075121	0,006801	–0,063798	–0,021197	0,017793	–0,057759
K03(-1)	–0,079616	0,139681	–0,03127	0,045212	–0,249097	0,095003*	–0,211062*	–0,394945*	–0,239346*	–0,494819*
K03(-2)	–0,086513	**0,325075***	–0,028271	0,036020	–0,03637	–0,071381	–0,042119	–0,012871	–0,089505	0,066139
X01(-1)	–0,01387	0,101934	**–0,033419***	–0,008994	–0,204453*	–0,014678	0,036565	0,229778*	0,150408*	0,230303*
X01(-2)	0,026357	–0,185884	–0,021424	–0,036981	0,080460	0,027622	–0,043852	0,019990	0,035431	0,106459
X02(-1)	0,043331	0,393585	0,048943	0,117201	0,113852	–0,012663	0,257894	–0,037383	0,047608	0,151590
X02(-2)	0,047737	0,257717	–0,009582	0,135440	–0,359744*	–0,073233	–0,001659	–0,086803	–0,196958	–0,020831
X03(-1)	–0,067216	–0,108526	–0,002673	–0,017685	0,045492	–0,011752	–0,044194	–0,059776	–0,043165	–0,11906*
X03(-2)	**–0,084409***	–0,11824	–0,00861	–0,060753*	0,144601*	0,019438	–0,000231	0,023295	0,004239	0,024764
X04(-1)	0,047762	–0,058984	–0,006677	–0,013102	–0,01141	–0,017705	–0,136627	–0,050528	0,010766	–0,290529*
X04(-2)	0,009935	0,029683	0,019693	–0,007091	–0,028563	0,004367	–0,023256	–0,029901	0,182693*	–0,240373*
C	–0,000389	0,001209	0,000200	0,000271	0,000943	1,59E–05	0,001604*	0,000307	–6,04E–05	0,001147
R-sq.	0,077178	0,075592	0,101263	0,113846	0,099869	0,129299	0,059881	0,111074	0,085855	0,133002
F-stat.	1,919379	1,876697	2,585822	2,948441	2,546282	3,408059	1,461800	2,867683	2,155417	3,520643
AIC	–6,09506	–4,411642	–8,400863	–6,789526	–5,141753	–7,299517	–5,448523	–5,801625	–5,560917	–5,491776
SC	–5,912457	–4,229039	–8,218259	–6,606923	–4,95915	–7,116914	–5,26592	–5,619022	–5,378314	–5,309173

(R-sq: R-square, F-stat: F statistics, AIC: Akaike information criteria, SC: Schwarz information criteria *Indicates statistical significance ($P<0.05$)).

Table 6: Varying variance and normality test findings

Component	Jarque-Bera	df	Prob,
1	2,116265	2	0,3471
2	1,189250	2	0,5518
3	1,510657	2	0,4699
4	0,245046	2	0,8847
5	0,146402	2	0,9294
6	0,241105	2	0,8864
7	1,600372	2	0,4492
8	1,042480	2	0,5938
9	0,193570	2	0,9078
10	0,931471	2	0,6277
Joint	9,216618	20	0,9803
Chi-square	**df**	**Prob,**	
2223,418	2200	0,3587	

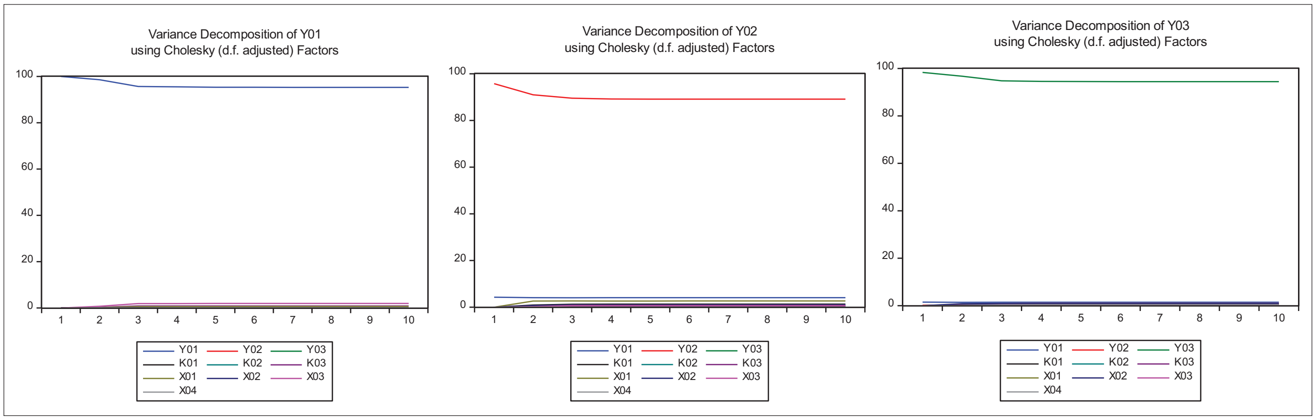
cause of Y03. In addition, all observed causality relationships were unidirectional.

Table 7: LM test findings for serial correlation

Lag	LRE* stat	df	Prob,
1	115,1159	100	0,1432
2	122,8569	100	0,0601
3	115,3558	100	0,1398
4	105,9886	100	0,3220
5	105,3175	100	0,3385
6	118,4415	100	0,1006

The variance decomposition analysis of YO1, Y02, and Y03 with the VAR(2) model is presented in Table 9, and the variance decomposition graph of the research variables is presented in Graph 3. While the whole (100%) variance decomposition of Y01 is completely on itself in the first period, this rate decreases to 95.3% in the tenth period. In the tenth period, the other variable that affects the variance decomposition of Y01 was X03 (1.9%). While 95.7% of the variance of Y02 is on itself in the first period,

Graph 3: Variance decomposition graph of research variables



Graph 4: The effects of a shock given to one of the research variables on other variables

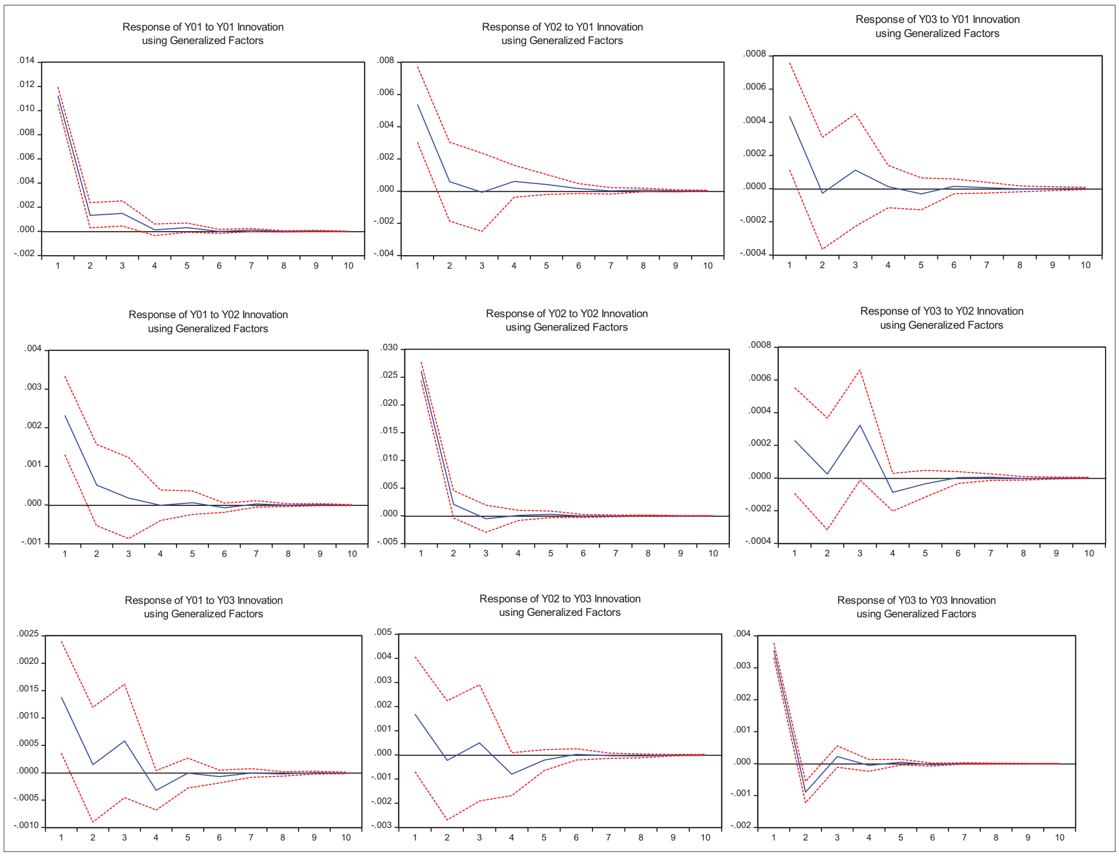


Table 8: VAR/granger causality analysis findings

Independent variable	Dependent variable	Chi-square	df	Prob.
X03	Y01	6,659919	2	0,0358
K01	Y02	5,416369	2	0,0667
Y02	Y03	6,169299	2	0,0457
K02	Y03	6,001099	2	0,0498
K02	K01	6,682674	2	0,0354
X02	K01	5,850127	2	0,0537
X02	K02	6,853607	2	0,0325
K02	K03	45,23817	2	0,0000
Y01	X01	7,653125	2	0,0218
Y01	X02	9,936636	2	0,0070
K03	X02	15,84698	2	0,0004
X01	X02	13,29878	2	0,0013
Y01	X04	6,606279	2	0,0368
K03	X04	18,12993	2	0,0001
X01	X04	10,62132	2	0,0049

this rate decreases to 85.1% in the tenth period. In the tenth period, the other variables that affected the decomposition of Y02 were Y01 (4.1%) and X01 (2.6%). While 98.3% of the variance of Y03 is on itself in the first period, this rate decreases to 95.5% in the tenth period. In the tenth period, the other variables that affect the decomposition of Y03 were Y01 (1.5%) and X02 (1%). In short, the ratios in the table and the graph in Graph 3 prove that their historical data has the largest share in explaining the variability of all three variables.

The effects of a shock given in any of the Y01, Y02, and Y03 variables on itself and other variables are shown graphically in Graph 4. One unit shock applied to Y01 has a positive effect on it in the first three periods and stabilized in the following periods. The effects of this shock on Y02 and Y03 were zeroed in the second or

Table 9: Variance decomposition analysis findings for VAR (2) model variables

Period	Y01	Y02	Y03	K01	K02	K03	X01	X02	X03	X04
1	100,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
2	98,58	0,05	0,00	0,02	0,00	0,27	0,15	0,11	0,72	0,10
3	95,66	0,06	0,12	0,36	0,32	0,86	0,57	0,11	1,85	0,10
4	95,50	0,06	0,21	0,36	0,32	0,86	0,57	0,11	1,88	0,13
5	95,31	0,06	0,21	0,43	0,38	0,86	0,58	0,12	1,92	0,13
6	95,30	0,06	0,21	0,43	0,39	0,86	0,59	0,12	1,92	0,13
7	95,28	0,06	0,21	0,43	0,39	0,86	0,59	0,12	1,92	0,13
8	95,28	0,06	0,21	0,43	0,39	0,86	0,59	0,12	1,92	0,13
9	95,28	0,06	0,21	0,43	0,39	0,86	0,59	0,12	1,92	0,13
10	95,28	0,06	0,21	0,43	0,39	0,86	0,59	0,12	1,92	0,13
Period	**Y01**	**Y02**	**Y03**	**K01**	**K02**	**K03**	**X01**	**X02**	**X03**	**X04**
1	4,26	95,74	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
2	4,07	90,96	0,02	0,91	0,50	0,00	2,62	0,67	0,23	0,03
3	4,00	89,49	0,06	1,26	0,57	0,28	2,63	0,97	0,70	0,03
4	4,04	89,19	0,16	1,29	0,70	0,28	2,63	0,97	0,71	0,04
5	4,06	89,15	0,17	1,29	0,70	0,28	2,62	0,97	0,71	0,04
6	4,06	89,11	0,17	1,30	0,70	0,28	2,64	0,98	0,71	0,04
7	4,06	89,10	0,17	1,30	0,70	0,28	2,64	0,98	0,71	0,04
8	4,06	89,10	0,17	1,30	0,70	0,28	2,64	0,98	0,71	0,04
9	4,06	89,10	0,17	1,30	0,70	0,28	2,64	0,98	0,71	0,04
10	4,06	89,10	0,17	1,30	0,70	0,28	2,64	0,98	0,71	0,04
Period	**Y01**	**Y02**	**Y03**	**K01**	**K02**	**K03**	**X01**	**X02**	**X03**	**X04**
1	1,51	0,16	98,33	0,00	0,00	0,00	0,00	0,00	0,00	0,00
2	1,40	0,16	96,70	0,18	0,39	0,28	0,09	0,79	0,00	0,02
3	1,46	0,83	94,79	0,37	0,52	0,43	0,18	0,89	0,23	0,31
4	1,45	0,89	94,51	0,41	0,56	0,44	0,25	0,91	0,23	0,35
5	1,46	0,89	94,45	0,41	0,58	0,45	0,26	0,91	0,23	0,35
6	1,46	0,89	94,45	0,41	0,58	0,45	0,26	0,91	0,23	0,35
7	1,46	0,89	94,45	0,41	0,58	0,45	0,26	0,91	0,23	0,35
8	1,46	0,89	94,45	0,41	0,58	0,45	0,26	0,91	0,23	0,35
9	1,46	0,89	94,45	0,41	0,58	0,45	0,26	0,91	0,23	0,35
10	1,46	0,89	94,45	0,41	0,58	0,45	0,26	0,91	0,23	0,35

third period. One unit shock applied to Y02 had a positive effect on it in the first two periods and was steadily zeroed in the following periods. While the effect of this shock on Y02 is positive in the first three periods, it zeroed in the third period. The effect on Y03 is positive and fluctuating in the first three periods and negative in the fourth period. Y03 has a positive effect in the first period, a negative effect in the second period, and is zeroed in the following periods. The effect of this shock on Y01 is positive in the first three periods, negative in the fourth period, and zero in the fifth period. The effect on Y02, on the other hand, fluctuates between negative and positive in the first three periods and becomes zero in the fourth period.

4. CONCLUSION AND RECOMMENDATIONS

In this study, we analyzed the factors affecting the daily returns of oil and energy companies traded on the KASE. VAR analysis showed that KZTO's own lagged (one and two periods) returns affect the daily return of KZTO. KASE index (one-period lagged) and dollar return (two-period lagged) were found to be effective on KZAP daily returns, and KZTO daily returns (one and two-period lagged) were found to be effective in KEGC daily returns. VAR/Granger causality analysis findings showed a causal link between FTSE CNBC Asia 100 Oil and Gas index and KZTO return, between the KASE index and KZAP return, between KZAP and KEGC return, and between the Ruble return and KEGC return. The variance decomposition analysis showed that the KZTO return, KZAP return, and KEGC return variables explain their variances themselves.

The VAR method is one of the most effective and easily applicable structural analysis methods in multivariate time series. There are different approaches to analyzing data in the econometric method. The multivariate regression model can be counted among these approaches. In particular, the variability in the research variables and the factors affecting them can be examined by using the natural variables of the Kazakhstan economy (such as inflation, and gross national product) as control variables. Another approach is to analyze daily returns using state-space models. Here, the Kalman filter can be considered a particularly effective method.

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