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THE RELATIONSHIP BETWEEN ENERGY PRICES, CDS, USD CURRENCY AND INFLATION RATE IN TURKEY[2]

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Abstract

Emerging economies are highly dependent on energy commodities in terms of both export for gaining cash inflow and import for meeting internal energy demand. Volatility of energy prices in international markets might spillover on net cash balance of individual countries due to its direct impact on foreign cash in/out flows which could increase overall fragility of countries. Developments in energy prices at international spot commodity markets directly affect Turkey because of its significant reliance on imported energy. Country's financial and macroeconomic indicators respond instantly to developments in external factors such as commodity prices.
To that end, the present paper investigates the impact response analysis between energy prices index quoted under title of "S&P GSCI Energy" derived from spot energy prices in the international markets and inflation, USD currency and sovereign CDS of Turkey by employing VAR model for the period of 2007M4-2017M1. The results show that a shock to energy prices has a negative impact on CDS and USD currency. At the same time, USD currency rate has a significant effect on the CDS and inflation.

Key words: *Standard and Poors Energy Commodity Index, Credit Default Swap (CDS), Exchange Rate, Inflation Rate, Turkey*
Jel Codes: *O43, G31, P24*

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Introduction

Both developed and developing economies are strongly dependent on energy commodity prices regardless of their position either an importer or exporter. When it comes to developing economies, subject to the vital importance of foreign funds for their financial sustainability, their dependency on energy prices is considered as highly critical. While in the importer role, energy prices in the current spot market determine the size of their individual energy bills which increases their current account deficit; in the exporter role, their fund inflow depends on spot prices by determining the size of the national income from export of energy commodities. Fluctuations in energy commodity prices in the international spot energy markets have direct influence on current account balances of countries and accordingly on their economic fragility.

Financially, fragile means the situation of borrowers indulging in economic activities as entrepreneurs with inadequate resources for the realization of their decisions (Bernanke and Gertler, 1990:88). Accordingly, fragility levels of developing countries highly dependent on global capital markets is measured by credit rating institutions; and considered as an important indicator for foreign investments (Bekkour et al., 2015:73). Financial markets assess country fragility by taking various economic indicators into account. Recent reports published by the established credit grading institutions are closely followed by “investor” members of economies with abundant saving, who are significantly effective on flows of global funds. In this regard, developing countries highly dependent on foreign capital are monitored by prominent credit grading institutions in terms of their macroeconomic indicators for classification based on their individual risk exposure. After Turkey’s nomination among the most fragile five (Morgan Stanley, 2013) and the recent fragile three countries (Barron’s, 2017) of the world, Turkey could be viewed as an economy more sensitive to the developments in the international spot energy commodity markets because of Turkey’s net energy-importer economy. Financial and macroeconomic indicators of Turkey especially current account balance respond to external factors such as variations in energy commodity prices (Aydın and Acar, 2011: 1726).

The concept of the “Credit Default Swap” (CDS) is a gift from the JP Morgan to the financial world in 1994 (Augustin et al., 2016:2). For purpose of monitoring financial risks in the market, CDS premiums are considered as an alternative tool apart from the sovereign credit scores (Mora-Jensen, 2006:9; Flannery et al., 2010:2095; Başarır and Keten, 2016:369). The CDS has been recognized as a useful tool which differentiates the default risk of bond issuer party from other risks clearly in assessment and pricing of the credit risk (Whetten, et al., 2004). Thus, CDS has been preferred over other credit derivatives (Norden and Weber, 2009:530). The greater the CDS price for a specific country, the higher the cost of foreign debt is (Fontana and Scheicher, 2010; Ericsson et al., 2009).

In the current literature on impacts of energy prices on economic and financial indicators, oil prices have been dominantly taken into consideration due to its significant place among global energy resources (Barsky and Kilian, 2004; Alexandre and De, 2010; Sharma and Thuraisamy, 2013; Kumar and Maheswaran, 2013; Yıldırım et al., 2014; Chen et al., 2015; Mollick and Radhamés, 2010; Ngoma et al., 2016; Kaya and Açdoyuran, 2017). In fact, global energy resources utilized by countries across the world are not only limited with crude oil but as well oil derivatives such as gas, diesel, as well as natural gas, methanol, ethanol, electric, coal, bio-fuels etc. In this sense, although crude oil is still fundamental energy input for country economies, large-scale approach was adopted regarding energy prices by including the impact of fluctuations in prices of other energy resources instead of considering crude oil prices solely. In this line, an energy index which takes energy-derived contracts on aforesaid commodities traded globally in the US Dollar currency across spot energy markets was taken into account. An example of these indexes, the S&P GSCI Energy Index quoted as one of the sub-indexes of the S&P GSCI, is referred as a public reliable benchmark for investors to assess energy commodity market. This index takes weighted averages of energy commodities around the world into a calculation. In this sense, the S&P GSCI Energy index is calculated primarily on a world production-weighted basis and includes principal physical energy commodities that are the subject of active, liquid futures markets (Standard and Poors, 2017).

Developments in energy prices at international spot commodity markets directly affect Turkey because of its significant reliance on imported energy. An unexpected increase in energy prices and USD exchange rate is negatively affecting production costs, which can trigger inflation upward. Energy price fluctuations especially influence on currency rates of countries with high financial fragility by escalating global risk perception. An increase in energy prices is expected to elevate energy expenditures and cast an adverse impact on macroeconomic indicators by increasing domestic energy bill and consequent pressure on inflation. On the other hand, a decrease in energy prices is expected to bring an advantaged position for Turkey in terms of both energy expenditures and current balance. Fluctuations in oil prices introduce a conflict of interest among economic superpowers around the World. Especially, the decline in oil prices has led to increasing the financial stress of oil importing countries due to the spillover effects of financial crises in oil-exporting countries (Kaya and Açdoyuran, 2017:151). So to what extent this has an effect on Turkey's credit risk perception? To find the answer to this question, it will be appropriate to examine the effect of energy prices on foreign exchange and inflation rates as well as the CDS risk premium.

To that end, the present study analyzed the relationship between energy commodity index referred as "S&P GSCI Energy" quoted by the Standard and Poors and inflation, USD currency rates and sovereign CDS risk premium of Turkey by employing VAR model for the period of 2007M4 - 2017M1. Within this framework, in Section 2 and 3, empirical studies from the relevant literature were summary presented. In Section 3 and 4, an empirical analysis was conducted and finally, acquired results and suggestions were exhibited.

2. LITERATURE REVIEW

In numbers of studies on the potential effect of energy prices on macroeconomic indicators and equity markets, oil prices have been investigated predominantly due to its extensive consumption as a primary energy resource. In terms of the relationship between energy prices and foreign exchange rate, for a pre-crisis period of 2000 – 2005, Zhang et al. (2008:380) used cointegration, VAR model, ARCH-type models and Granger causality test to explore mean, volatility and risk spillover effects with respect to the influence of US Dollar on the international crude oil price. Authors report significant long-term equilibrium cointegrating relationship between the two markets. The US dollar's depreciation over the years is shown as the key factor driving up the international crude oil price. In spite of apparent volatility and clustering for the two market prices, their volatility spillover effect is reported as insignificant. US Dollar and energy markets' risk spillover effect is found to be quite limited. Similarly, based on the study employed VAR method on oil price and US dollar quotations around the World, Grisse (2010) also report that higher oil prices depreciate the US Dollar both in the short run and over longer horizons; US short-term interest rates explain much of the long-run variation in oil prices and Dollar exchange rate.

In the same way, Mollick and Radhamés (2010:402) by employing the VAR method and adding oil prices into the monetary model of exchange rates, report that oil prices significantly explain movements in the value of the U.S. dollar (USD) against major currencies from the 1970s to 2008. Authors also report that increases in real oil prices lead to a significant depreciation of the USD against net oil exporter currencies, such as Canada, Mexico, and Russia whereas the currencies of oil importers, such as Japan, depreciate relative to the USD.

Ferraro et al. (2011) tried to predict foreign exchange rates for Canada by using oil prices and US Dollar currency rate for the period of 1984 and 2010. Their empirical results suggest that oil prices can predict the Canadian-US dollar nominal exchange rate at a daily frequency.

A similar relationship was also investigated for India by Kumar and Maheswaran (2013:72). Researchers examined the return, volatility, upside risk and downside risk spillover effects from crude oil prices and the US$/INR exchange rate to the major Indian industrial sectors on the basis of Hong's (2001) approach by utilizing from the generalised autoregressive conditional heteroskedasticity (GARCH) class of models grounded on the generalized error distribution (GED) to estimate extreme upside and downside Value-at-Risk (VaR). Researchers reveal significant volatility and return spillover effect from the crude oil market to the Energy. They also exhibit evidence of significant volatility spillover from crude oil prices and US$/INR exchange rate to the Energy sectors. In addition, two-way downside risk spillover between crude oil prices and the US$/INR exchange rate was reported.

Ngoma, Normaz, and Zulkornain (2016:535) investigated the long-term relationship between real oil prices and exchange rates in five prominent oil-exporter African countries of Egypt, Ghana, Nigeria, South Africa and Tunisia by employing symmetric and asymmetric cointegration tests and an error-correction modeling technique. Authors present evidence for the long-term co-movements between real oil prices and real exchange rates, which suggests the symmetric adjustment of the real exchange rates to the long-term equilibrium values in Egypt, South Africa, and Tunisia, caused by changes in real oil prices. Furthermore, authors provide evidence for persistence and asymmetric adjustments of the real exchange rates to the long-run equilibrium path after an increase in oil price shocks in Ghana and Nigeria. Moreover, short-term analysis of the relationship yields evidence for real exchange rate appreciations in Nigeria, South Africa and Tunisia and real exchange rate fluctuations in Egypt and Ghana.

In spite of the abundance of studies investigating aforesaid relationships, there is limited literature available studying the relationship between CDS and energy prices. Alexandre and De (2010:8) analyze the impact of oil price on sovereign bond risk premiums issued by seventeen emerging economies for the period of 1998 to 2008. A panel analysis was utilized to determine the global impact of oil prices on the risk perceptions of investors. Authors report a new estimator for the oil price to take into account the effect of the price variance and that the oil price influences the risk premiums of sovereign bonds.

In terms of the relationship between energy price and CDS risk premium, Duffie, Pedersen, and Singleton (2003:124) analyzed the relationship between credit spreads on sovereign bonds, reserves of the Russian Central bank and oil price for oil exporter Russia by using VAR model with monthly data for period February 1994 to July 1998. Authors address that positive shocks to oil prices are estimated to state a reduction in the spread.

Sharma and Thuraisamy (2013:52) tested whether oil price uncertainty predicts credit default swap (CDS) returns for eight Asian countries by employing Westerlund and Narayan's (2011) predictability test. Whereas "in-sample" evidence reveals that oil price uncertainty predicts CDS returns for three Asian countries, "out-of-sample" evidence suggests that oil price uncertainty predicts CDS returns for six countries.

Aizenman, Hutchison, and Jinjarak (2013:40) analyzed dynamics of CDS spreads for fifty countries by using dynamic panel analysis for period 2005-2010. They found that only inflation is systematically and robustly correlated with CDS spreads (higher inflation leads to higher spreads). Similarly, Doshi, Jacobs, and Zurita (2017:51) estimated a model with three global and four local covariates using CDS spreads (5 years maturity) and twenty-five countries. According to cross-sectional relation results, there was a positive relationship between CDS spreads and inflation. High inflation rates cause high CDS spread.

By oriented on the after-crisis period, 2006 to 2016, Bouri et al. (2017:158) investigated the volatility transmission from commodities to CDS spreads of emerging and frontier markets by using GARCH-based model. Using daily data for seventeen emerging and six frontier countries, authors report a significant volatility spillover from commodity markets to sovereign CDS spreads of emerging and frontier markets. Authors report that this effect is strong for the majority of the countries included in the sample, but different results seen by country and along different time. 10 out of 17 emerging market CDS are affected by commodity price volatility and four out of six frontier markets experience a significant volatility spillover. Particular commodity sectors such as energy and precious metals are found to be the main driver of the transmission of volatility and findings indicated a strong effect of volatility. Energy and precious metal commodities are addressed as large contributors to sovereign spreads volatility across the most countries.

Kaya and Açdoyuran (2017:151) established the financial distress index for Turkey and investigated its correlation with oil prices by means of the ARDL approach. As for the short term, authors report negative correlation, for the long term, they report a statistically significant, negative but low level of relationship (-0.1%) between financial distress and oil prices. The correlation between oil prices and financial distress is reported as that 32% of short-term instability would return to equilibrium on the long term.

In terms of the relationship between inflation and energy price, current literature reflects different approaches based on various characteristics of countries such as macroeconomic indicators, country size, their energy dependency and export mixture or time period. Öksüzler and İpek (2011:21) studied effects of oil price changes on Turkey's macroeconomic variables of growth and inflation by utilizing vector autoregressive model (VAR) on monthly data from the period of 1987:1 to 2010:9. According to the Granger analysis results based on the VAR model, authors conclude that there is one-way causality running from oil prices to economic growth and no causality between oil prices and inflation; and that a positive oil price shock increase both the growth of GDP and inflation.

The study of Cong and Shaochuan (2013) investigated the relationship between energy price shocks and macroeconomic indicators of China by multivariate vector autoregression. Authors report 5-month lag effect of energy price shocks on inflation and that rising energy price affects the Chinese macroeconomic indicators while it pushes up the inflation rate. Authors nominate China in a risky position in terms of cost-push inflation. Similarly, in another study conducted on South Asian economies of India and Pakistan, Rehman (2014:45) reports that oil prices have cost side effects on inflation and emphasizes the strong causality between the international oil prices and inflation for India and Pakistan.

By approaching from a different angle, Verbrugge and Higgins (2015) studied the impact of energy price changes on inflation expectations of American household through comprehensive survey method. Authors conclude that energy prices have a greater influence on the long-term inflation expectations. In parallel, Sussman (2015) stressed in the World Economic Forum that data from the US, the Eurozone, the UK show that oil prices have a strong correlation with inflation expectations for the medium term, as measured by five-year breakeven inflation rates.

For the extensive period covering 1980 to 2010, Sek et al. (2015:632) grouped countries based on their energy dependency levels and investigated effects of oil price changes on their inflation rates and exchange rates besides other variables by employing (ARDL) format. Whereas high-oil dependent countries were Singapore, Philippines, Greece, Belgium, Italy, Pakistan, India, Portugal and Spain, the ones with low-dependency to oil were Norway, Denmark, UK, Canada, Mexica, Malaysia, Brazil, Ecuador, Bulgaria, and Venezuela. Researchers reveal that oil price change has a direct effect on domestic inflation in low-oil dependent group but indirect effect on domestic inflation in the high-oil dependent group through changes in the exporter's production cost.

Parker (2017), in its study on the impact of energy prices on global inflation in the ECB Working Paper, used a comprehensive dataset of consumer prices for 223 countries for the period 1980-2012 in order to determine the role of global factors causing common movements in consumer price inflation. The author reports that while global factors including energy prices explain a large share of the variance of national inflation rates for developed countries, but not for median and low-income countries. Furthermore, by employing the dynamic hierarchical factor model suggested by Moench et al. (2013:1813), the author showed the significance of global factors such as energy price in particular for countries with higher GDP per capita, greater financial development and greater central bank transparency, the greater share of global factors in explaining national inflation variance.

As one of the countries strongly dependent of energy import and foreign investment, Turkey's highly sensitive position against fluctuations in energy prices and this sensitivity's influence on relevant risk perception of lenders necessitated empirical investigation of the relationship between energy prices and CDS premium.

The scarcity of the available literature on this relationship in Turkey reinforces the significance of the present study. In the econometric analysis section of this study, the study of Duffie et al. (2013:124) was considered as reference points and the VAR analysis method which does not require economic theory foundation.

3. DATA AND METHODS

3.1. Data Set

This study analyzes the relationship between Turkey's sovereign CDS of 5 year maturity (CDS) and, crude oil prices believed to represent overall global spot prices FOB (free on board) dollars per barrel, inflation (ITO TEFE, 1968=100, π) and USD currency (official quotations of the Turkish Central Bank, USD) rates by means of the VAR model for the period of 2007M4-2017M1. Since the reliable data can be reached from 2007, the analysis start date was determined as 2007M4. Study data was acquired from websites of U.S. Energy Information Administration (www.eia.gov), Bloomberg (www.bloomberg.com) and Central Bank of Republic of Turkey (www.evds.tcmb.gov.tr). Logarithms of energy price index (, inflation index (π) and CDS values were included in the analyses to have figures at a measurable level.

3.2. Methods

The stationarity of series was analyzed by means of the (Augmented) Dickey-Fuller (ADF) (1979) and Philips-Perron (1988) (PP) unit root test. Whereas the ADF test follows the AR process, the PP test follows the moving averages process. The relationship between series was investigated by the VAR (Vector Autoregressive) model developed by Sims (1980), which analyzes all variables based on their classification in internal or external groups. And also using the lagged dependent variables in VAR model can help improve forecasting based on given values by then the forecast is constituted (Kumar et al., 1995).

Generalized VAR model of k number of variables was given below (Tarı, 2011:452-453);

Where a vector of a model variable, c is is a vector of intercept terms, is parameter matrix and is a vector of error terms.

Since parameters of the VAR model could not be interpreted directly, our findings were reported by utilizing generalized impulse-response functions and variance decomposition analyses.

4. FINDINGS

4.1. Unit Root Analysis

An important assumption of the classical regression model that time series should be stationary and that error terms have a zero mean and a finite variance (Enders, 2010:195-96). In this context, the stationary of variables was analyzed by using Augmented Dickey-Fuller (ADF) (1979) and Philips-Perron (PP) (1988) unit root tests. Unit root test results are reported in Table 1.

Table 1: Results of the ADF and PP Unit Root Tests

Variables	ADF Test Statistics		1% Critical Value		PP Test Statistics		1% Critical Value	
	Intercept	Intercept and Trend	Intercept	Intercept and Trend	Intercept	Intercept and Trend	Intercept	Intercept and Trend
	-2.574638	-2.916993	-3.487550	-4.039075	-2.201357	-2.558948	-3.487046	-4.038365
CDS	-2.660891	-2.648322	-3.487046	-4.038365	-2.698953	-2.686469	-3.487046	-4.038365
USD	2.765185	0.200879	-3.487046	-4.038365	2.573857	0.200879	-3.487046	-4.038365
π	0.313495	-2.714111	-3.487550	-4.039075	0.182103	-2.302971	-3.487046	-4.038365
Δ ***								
-6.571982	-6.563197	-3.487550	-4.039075	-6.516274	-6.508957	-3.487550	-4.039075	
ΔCDS***	-11.72454	-11.67428	-3.487550	-4.039075	-11.75191	-11.70027	-3.487550	-4.039075
ΔUSD***	-8.627815	-9.138428	-3.487550	-4.039075	-8.623253	-9.139377	-3.487550	-4.039075
Δπ***	-6.113055	-6.111485	-3.487550	-4.039075	-6.105377	-6.100360	-3.487550	-4.039075

Not: Δ and *** denotes the first difference of variables and significance at the 1% levels, respectively.

Stationarity analysis of series was conducted by two different models of "intercept" and "intercept and trend". For both test models, optimum lag length was determined as [0] for all variables. According to Table 1, level values of series are not stationary, but after their first difference is taken, they became stationary. It was concluded that time series were 1st degree integrated I(1) series.

4.2. The VAR Model

The VAR model is applied to the stationary series. Using stationary series and a standard VAR model, the optimum lag length was estimated and the respective results were exhibited in Table 2.

Table 2: Optimum Lag Length Test Results

Lag Length	LR	FPE	AIC	SC	HQ
0	NA	9.14e-08	-4.856398	-4.754691*	-4.815194
1	70.67801	6.09e-08*	-5.262625*	-4.754089	-5.056602*
2	17.25485	6.92e-08	-5.136563	-4.221197	-4.765721
3	29.46228	6.83e-08	-5.152632	-3.830437	-4.616972
4	19.92912	7.44e-08	-5.074010	-3.344985	-4.373531
5	26.43243*	7.44e-08	-5.084781	-2.948927	-4.219484
6	16.90341	8.30e-08	-4.991056	-2.448372	-3.960940
7	18.55064	9.02e-08	-4.930705	-1.981192	-3.735771
8	6.117371	1.16e-07	-4.709173	-1.352831	-3.349420
9	21.34639	1.19e-07	-4.720084	-0.956912	-3.195512
10	18.09979	1.28e-07	-4.699690	-0.529689	-3.010300
11	23.52548	1.25e-07	-4.790734	-0.213904	-2.936526
12	22.99054	1.21e-07	-4.901052	0.082608	-2.882025
13	20.26541	1.22e-07	-4.990720	0.399769	-2.806875

Not: * denotes the optimum lag lengts determined by the information criterion.

Since acquired times series are montly data, the maximum lag lenth was set as 13; the lag length minimizing the criterions of Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike (AIC), Schwarz (SC) and Hannan Quinn (HQ) was tried to be determined. Table 2 suggests the optimum lag length for the LR criterions as 5, for the FPE, AIC and HQ criterions as 1, and for the SC criterion as 0. Accordingly, it is the most appropriate to select the most lag length (*) as the optimum value. But, when obtained lag lengths are applied autocorrelation and heteroscedasticity, it is seen that the optimum lag length which does not include autocorrelation and heteroscedasticity is 5 which is estimated according to the LR criterion. The analysis results of the optimum lag lenth of 5 are exhibited in Table 3 and 4.

Table 3: The Autocorrelation Test for the Lag Length of 5

Lag Lenth	LM-Statistics	Probability Value	Lag Lenth	LM-Statistics	Probability Value
1	16.63497	0.4096	7	10.88951	0.8163
2	15.48018	0.4898	8	27.51552	0.0361
3	9.372239	0.8973	9	17.24026	0.3702
4	14.65692	0.5499	10	20.40396	0.2026
5	9.725418	0.8806	11	14.55826	0.5572
6	21.51143	0.1597	12	20.52019	0.1977

Not: The probability value greater than 0.05 suggest that there is no autocorrelation issue at 5% statistical significance level.

Table 4: Heteroscedasticity Test for the Model with 5 Lags

Chi-Square Statistics	Degree of Freedom	Probability
422.9869	400	0.2058

Not: The probability value greater than 0.05 suggest that there is no autocorrelation issue at 5% statistical significance level.

According to these results, the estimation of the VAR model was structured with 5 lags. Since it is not possible to assess estimation results of the VAR model, results of the impulse-response functions and variance decompositions are taken into consideration for further analysis.

4.3. Variance Decomposition Analysis

Variance decompositions are employed to explain causes of changes in each variable whether from itself or other variables. Obtained distribution charts are assessed based on the value at the first period in which price shocks lose their impacts. The results of CDS variance decomposition approach are reported in Table 5.

According to Table 5, the share of the USD in the variance distribution of inflation increases with the long-term. An approximately 35% portion of inflation is explained by its own shocks; 26 % is explained by energy prices; 29% is explained by USD and 10% is explained by the CDS risk premium in 30th period. This result shows that inflation has similar sensitiveness to USD and energy prices.

In the medium term, the contribution of energy prices to USD is an approximately 16% and 60% portion of USD is being explained by its own shocks. Inflation and CDS risk premium have an impact on USD by 15 % and 9%, respectively. The finding that USD has an almost equal sensitivity toward variables of energy prices and inflation is considered as an evidence that USD responds to both internal and external shocks at almost the same degree.

According to Table 5, it is observed that CDS is experiencing significant momentary and immediate reaction to inflation and USD in the short term. the share of the USD and inflation in the variance distribution of CDS increases with the long-term. In the short term, According to middle term, inflation and USD explain in average 12% and 8% portion of CDS risk premium by their own shocks. The contribution of crude oil prices to CDS risk premium is 4%. 45% portion of CDS risk premium contributed by its own shocks.

Table 5: Variance Decompositions Results of CDS

Variable	Period			USD	CDS
	1	0.000000	0.000000	0.000000	100.0000
	2	0.032680	0.261305	0.000783	99.70523
	3	0.378830	0.644483	0.375048	98.60164
	4	0.367653	1.768706	3.262102	94.60154
	5	1.575938	6.704181	3.661596	88.05828
	6	3.771527	7.542016	5.387329	83.29913
	7	3.959458	8.934203	5.382538	81.72380
	8	3.832406	11.87256	5.357758	78.93727
	9	3.931049	11.93934	5.347682	78.78193
	10	3.987869	11.94954	5.904447	78.15814
	11	4.055455	11.96016	6.438674	77.54571
CDS	12	4.031094	11.98211	6.864628	77.12217
	13	4.023331	11.95895	7.100942	76.91677
	14	4.010898	12.12318	7.292890	76.57303
	15	3.991297	12.18928	7.588886	76.23054
	16	3.987676	12.25008	7.708020	76.05422
	17	3.990261	12.26780	7.808385	75.93355
	18	3.988526	12.28664	7.857846	75.86699
	19	3.984331	12.30711	7.908218	75.80034
	20	3.983445	12.30489	7.952429	75.75924
	25	3.991126	12.28737	8.064297	75.65721
	30	3.990336	12.28067	8.149100	75.57989
	35	3.988236	12.28243	8.187942	75.54139

4.4. Generalized Impulse-Response Functions

Impulse-Response functions were structured for 30-period length by analytic method and generalized impact. In this analysis, the required confidence intervals of impulse-response functions are obtained by using Monte Carlo simulations (for standard errors). Since model variables are highly sensitive to economic shocks, each variable was applied generalized impact and obtained results were exhibited in Figure 1. In assessments of the obtained charts, the response of the variable against its impact was assessed first. The response to other variables towards the first augmenter or dimmer shock was observed.

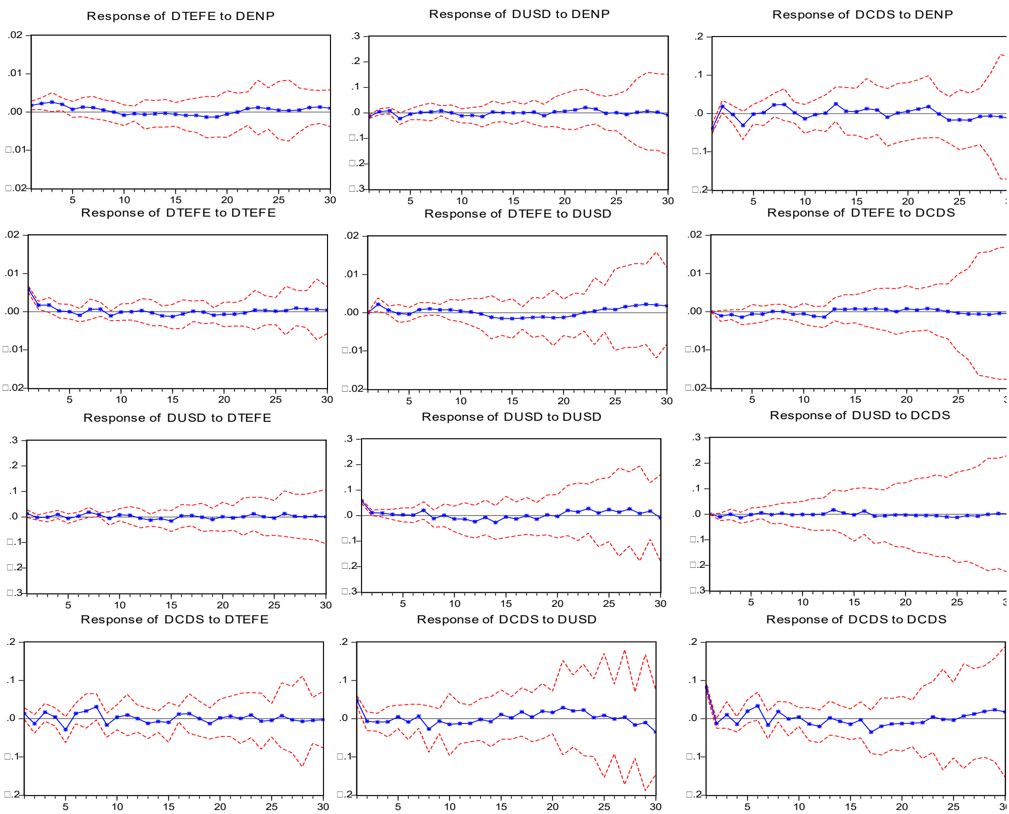
According to Figure 1, a decrease in energy price index would result in production costs associated with energy prices and this situation would reduce inflation rate after a five period. The first reaction of USD to this development is an increase. A negative correlation was revealed between energy price index and USD which both are considered as an investment tool. In terms of the impact on CDS, it could be seen that the first impact tends to increase, but persisting decrease pushed CDS risk premium downward after two periods. Owing to intensive energy dependency of Turkey, CDS decreases as a respond to decreasing energy prices. Energy price shocks lose their impact in 26 periods in average; that is, the impact of the first shock persists about two years.

The decrease in inflation is not found to be influent on the international variables of energy price index and USD on the basis of study findings. CDS responded to decrease in inflation with similar attitude due to the positive impact of such development on Turkey's economy. But, it maintained fluctuation subject to other macroeconomic factors; and its impact persisted about 20 periods.

In terms of the USD variable in the present study, when significance domestic production in substitution of energy import is taken into consideration, inflation responds by decreasing after a period. Inflation is negatively correlated with both energy price index and CDS. USD shocks have a longer impact on the Turkish economy and they last about 30 periods on average.

The most significant impulse-response impact of CDS was determined with the USD because a decrease in CDS risk premium would result in an increase in the foreign capital entry to Turkey, which depreciates USD against TL.

Figure 1: Impulse-Response Function Charts



5. CONCLUSION

Any positive or negative shock in energy prices influences energy importers as well as exporters significantly. However, developing economies of net energy-importer countries such as Turkey strictly dependent on energy import because of the scarcity of substitute energy commodity is highly sensitive to international energy price fluctuations. Therefore, any energy price shock could potentially influent on the credibility of these countries and the investors' risk perceptions towards these countries, on their currency and inflation rates. Analysis results of the present study suggest that Turkey's inflation and CDS risk premium responds positively against decreasing shocks in energy prices. However, USD currency rate responds negatively and this lasts about two years. It was also determined that Turkey could not exploit the decrease in energy prices by using as leverage to reduce its production cost because of the increase in USD.

In parallel to other findings reported in the literature, it was found that inflation in Turkey is influenced significantly by fluctuations in global energy prices and USD currency; and that USD is influenced mostly by global energy price shocks. CDS risk premium is variably influenced by multiple macroeconomic indicators. Yet, about 55% of changes in CDS premium is caused by the variables other than itself. When aggregate change impact is considered for Turkey, fluctuations in the energy price index are found significantly important. Excessive sensitivity against fluctuations in energy price intensifies the general perception of economic risk and fragility relevant with a certain country. Turkey lacks adequate national saving and is a country highly dependent on foreign capital. Therefore, negative consequences on CDS premium, a tool for measuring the credibility of a country, would be obstacles before foreign capital entry.

In an attempt to measure the impact of energy prices on certain economic indicators, the present study oriented on a global energy price index in the relevant analyses. It is emphasized that strengthening a position of alternative energy resources against mostly traded conventional energy resources of crude oil and technology's advanced role for individual countries to substitute an energy resource with another more efficiently for less costs are required to be taken into consideration.

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