

## CONSUMER CONFIDENCE IN A STRUCTURAL VAR MODEL FOR A SMALL OPEN ECONOMY: TURKISH CASE\*

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### Abstract

This study constructs a 7-variable Structural Vector Autoregressive (SVAR) model for Turkish economy to investigate the dynamic relationship between interest rate, oil price, international interest rate, inflation rate, production, consumer confidence index and exchange rate for the monthly period of 2006-2012. Moreover, this paper suggests that consumer confidence is not only an indicator that encompasses economic conditions but also reflects the behaviors/decisions of the consumers apart from the quantitatively observed economic conditions. Such decisions, which may be referred to as Keynes's prominent concept of "animal spirits", determine the production level through entrepreneurial activities. Empirical findings confirm the link from consumer confidence to production level.

**Keywords:** Consumer Confidence, Interest rate, SVAR

**JEL Classification:** C32, D12, E43, F41

## KÜÇÜK AÇIK BİR EKONOMİ İÇİN YAPISAL VAR MODELİNDE TÜKETİCİ GÜVENİ: TÜRKİYE ÖRNEĞİ

### Öz

Bu çalışma, faiz oranı, petrol fiyatı, uluslararası faiz oranı, enflasyon oranı, üretim, tüketici güven endeksi ve döviz kuru arasındaki dinamik ilişkiyi araştırmak üzere Türkiye ekonomisi için 2006-2012 aylık dönemine ilişkin 7 değişkenli bir Yapısal Vektör Otoregresif (SVAR) modeli kurmaktadır. Çalışma tüketici güveninin yalnızca ekonomik koşulları içeren bir gösterge olmadığını, aynı zamanda niceliksel olarak gözlemlenen ekonomik koşulların dışında kalan tüketici davranışlarını/kararlarını yansıttığını iddia etmektedir. Keynes'in önde gelen "hayvansal güdüler" kavramı olarak adlandırılacak bu kararlar, girişimcilik faaliyetleri ile üretim seviyesini belirlemektedir. Ampirik bulgular, tüketici güveninden üretim seviyesine olan bağı doğrulamaktadır.

**Anahtar kelimeler:** Tüketici Güveni, Faiz Oranı, SVAR Yaklaşımı

**JEL Sınıflaması:** C32, D12, E43, F41

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## **1. Introduction**

Turkish economy suffered many decades from the turmoil brought by high inflation. CBRT has been implementing explicit inflation targeting regime since 2006 and Turkish economy experienced remarkably low inflation rates after the start of implicit inflation targeting regime in 2002. Until May 2010, policy rate was overnight interest rate. After that period, one-week repo became the main policy rate.

After 2001 February political and domestic crisis, crawling exchange rate peg regime adopted in 2000 was abandoned and Turkish currency was left to float. The new monetary policy is determined to be inflation targeting (IT) regime. An implicit form of IT regime<sup>1</sup> was adopted until some economic conditions are satisfied. Public burden was a crucial obstacle to IT regime since risk premium due to default risk in high budget deficit economies put upward pressure on exchange rate and hence on inflation expectations, which is one of the main determinants of current inflation rate together with output gap as given in a standard New Keynesian Phillips curve. Hence, public issues are at the heart of the economic policy in order to accomplish an active monetary policy. Moreover, Kara (2006) states that new public debt as a ratio to GNP is more than 90% and more than half of the total government debt stock was denominated in foreign currency making Turkey fragile against an external shock. Another impediment against properly working monetary policy is the uninformed and inexperienced public regarding the new monetary policy regime. Within the implicit IT period, fiscal reforms are implemented and communication facilities are prepared in order to achieve the targets.

Following that period, together with the global savings glut (Bernanke, 2005), Turkey, as an emerging economy, was one of the stops of international capital searching for high-return investments. Increased confidence rose capital inflows in Turkey and as well as the primary objective of maintaining price stability, financial globalization turned out to be one of the main challenges of Central Bank of the Republic of Turkey (CBRT). Capital inflow was more than \$40 billion between 2002 and 2006 period. However, CBRT was successful in managing capital inflows through market operations. Global liquidity abundance lasted from late 1990s until financial market crash in the summer of 2007. After the crisis, advanced economies implemented expansionary monetary policies, leading to excess global liquidity once again, and Turkey was again one of the stops of international capital.

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<sup>1</sup> As Kara (2006: 3) states “implicit inflation targeting can be defined as a period under which inflation targets are announced to the public, but not the regime and its details as such. It involves country acting as if inflation targeting were in place without a formal adoption of the regime.”

Oil prices has exhibited exponential rise after 2000s until the financial crash together with the decline in oil demand. However, oil prices recovered quickly and reached the numbers before crisis. Federal funds rate declined severely in the crisis in order to revive the US economy. Under such global and domestic conditions, a 7-variable Structural Vector Autoregressive (SVAR) model for Turkish economy is estimated to investigate the dynamic relationship between interest rate, oil price, international interest rate, inflation rate, production, consumer confidence index and exchange rate in the monthly period of 2006-2012. The dataset covers the period after more stabilized economic indicators are observed. This paper suggests that consumer confidence is not only an indicator that encompasses economic conditions but also reflects the behaviors/decisions of the consumers apart from the quantitatively observed economic conditions. Such decisions, which may be referred to as Keynes's prominent concept of "animal spirits", determine the production level through entrepreneurial activities.

Regarding the link between inflation, interest rate and GDP, there are several papers in the literature (Choi, 1999; Stock and Watson, 2001; Bernanke and Mihov, 1998; Sousa and Zaghini, 2007; Leu, 2011). The effect of exchange rate on inflation is analyzed in the exchange rate pass-through literature which examines how changes in exchange rates or import prices impact or pass-through into domestic consumer prices (Frankel et al., 2005; Leigh and Rossi, 2002; Volkan et al., 2007; Naz et al., 2012). In a similar fashion, Kim (2005) analyze the interactions between monetary and exchange rate policies are examined using under SVAR modeling.

The rapid increase in oil prices, especially after 2003, caused a global attention to the impact of oil prices on the world economies. Hence, empirical literature on open economy perspective quite often employs oil prices as one of the key variables to be examined using VAR or SVAR models (Ahmed and Wadud, 2011; Tang et al., 2010; Kilian, 2009; Dođrul and Soytaş, 2010; Golub, 1983; Basher et al., 2012). Researchers frequently refer to puzzles while examining the macroeconomic effects of monetary policy shocks (Bhuiyan and Lucas, 2007; Kahn et al, 2002; Eichenbaum, 1992; Thorbecke, 1997; Christiano et al., 1994) that reflects the importance of the choice of monetary policy indicators. Lastly, the literature on consumer confidence is vast that advocate the predictive power of consumer sentiments regarding consumption expenditures (Carroll et al., 1994; Matsusaka and Sbordone, 1995; Acemoglu and Scott, 1994; Bram and Ludvigson, 1998; Hüfner and Schröder, 2002; Ludvigson, 2004; Kwan and Cotsomitis, 2006). On the other hand, some studies (Van den Abeele, 1983; Garner, 1991; Fuhrer, 1993; Ludvigson, 1996) contradict with the link between consumer sentiments and consumption expenditure. Regarding this link, Özdemir (2013) observes that CCI helps forecast the total consumption expenditures for Turkey using quarterly dataset for the period of 2004-2012.

Recently, structural vector autoregressive (SVAR) models have become highly popularized in the literature especially on monetary transmission mechanism and business cycle fluctuations. In a complex system, there are many functions suggesting existence of various relationships. In such a case, methodology based on simultaneous equations system would stand out. Likewise, Vector Autoregressive (VAR) methodology, first introduced by Sims (1980), is based on simultaneous equations system that enables the researcher to observe the dynamic relationships between multiple time series. The methodology treats all variables as endogenous, i.e., each variable is regressed on all variables, with specified number of lags. VAR model is practical since no restriction is specified when there is ambiguity about the structure of the model. Contrary to this simplicity, VAR methodology is criticized at some points. The major criticism towards VAR (also referred to as standard VAR) is directed to its atheoretical structure, i.e., there is no underlying economic theory which bring about the development of SVAR methodology with the pioneers of Bernanke (1986), Blanchard and Watson (1986) and Sims (1986). In the SVAR methodology, theoretical identification is attained by imposing restrictions on both the structure of the economy and the stochastic structure of the model. Theoretical knowledge is required for the identification problem, as mentioned in Stock and Watson (2001). They explain SVAR analysis as the methodology that uses economic theory to sort out the contemporaneous links between variables in question and state that SVAR requires “identifying assumptions” that allow correlations to be interpreted causally. Moreover, Grilli and Roubini (1996) highlight the strength of SVAR in dealing with the puzzles in the models with monetary policy.

The paper is organized as follows. Section 2 explains consumer confidence index and the importance of it as an economic indicator. Section 3 summarizes the methodology in details. Section 4 explains the model and the data and presents the empirical findings. Last section concludes the paper.

## **2. Animal Spirits and Consumer Confidence Index**

Expectations about future are very crucial in the economics since changes in expectations can totally alter the economic stance. Investors and monetary authority wish to learn about expectations regarding the economy in order to act earlier and lower the loss emerging from uncertainties. Households also try to foresee the future economic conditions and optimize their life time utility function. Expectations lie at the very center of economics as all agents optimize their objective functions taking into account of the future. Under the assumption that demand precedes supply, how consumers plan to act in the future is a very sound information to identify expected demand. At this point, consumer sentiments emerge as a research topic for its role as a leading indicator.

Since the prominent “animal spirits” argument of Keynes, economic researchers scrutinized how sentiments of agents, either consumers or firms, affect the economic fundamentals. Many years after, George Katona (1951) developed confidence measures in order to explain how income expectations affect spending/saving behavior. He argues that consumer spending depends on ability and willingness to buy. Consumer confidence/sentiment indices question the respondents about their ability and willingness to buy through a poll.

In their book of how human psychology drives the economy, Akerlof and Shiller (2009: 1) explain that to understand the working mechanism of economies, one must pay attention to the ideas, feelings of the agents, i.e., animal spirits. Actually, they go beyond claiming that it is unfortunate to assume that variations in feelings, etc. do not matter but technical factors or erratic government action do matter in the aggregate.

Blanchard (1993: 274), in his well-known paper on the recession of 1990-1991, states that the recession is associated with large negative consumption shocks and these shocks have long-lasting effects on output. In order to explain where these shocks come from, he comes up with two interpretations: foresight and animal spirits. The former one is argued to be the consumption shocks that are triggered and followed by the changes in income. The latter interpretation is that changes in consumption emerge due to intertemporal preferences, not changes in future income. As an evidence for consumption shocks, he highlights consumer confidence index and that the index suggests many information<sup>2</sup>. Similarly, Akerlof and Shiller argue that loss of confidence is the reason for economic downturns. Regarding the role of confidence, Akerlof and Shiller (2009: 13) highlight the irrationality of behavior -opposite to the suggestion in standard economic theory- that people buy when they are confident and they sell when they are not and people give investment decisions based on their confidence similar to Keynesian animal spirit concept.

Physical constraints of the firms (such as existing in competitive market conditions) bring about the necessity to foresee demand, i.e., consumer behavior, in order to match their supply and demand. Especially, small and medium scale enterprises (SMEs) need to decide on the production level taking into account of demand expectations. Such firms need to foresee consumer behavior in order to survive in the highly dynamic and competitive market conditions. Firms use their instincts, i.e., animal spirits, to foresee demand (and entrepreneurial opportunities). There is no indicator to embody the instincts of the producers. The instinct is about forecast on demand (or consumer behavior) that is not measurable. In

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<sup>2</sup> In his examination, the decline in consumer confidence index is prior to the decline of leading indicators or commercial forecasts of the recession. On the other hand, the non-economic event of Kuwait war in 1990 led to a large decline in consumer confidence and remained low for a long time.

this study, it is argued that the instincts, necessarily taken into account by SMEs, may be proxied by consumer confidence index, i.e., the mood (pessimism or optimism) of the consumers independent of the economic fundamentals. This study does not assert that firms follow consumer confidence. Rather, it is argued that consumer confidence includes an information regarding future consumption and that this information may be used as a proxy for the “animal spirits” of the producers that is not identified as an indicator.

Katona (1951), who primarily uses surveys with his associates in the University of Michigan in the 1950s, argues that since consumer behavior is unpredictable, survey measures of consumer sentiment may contribute in order to forecast consumer spending. The first survey, namely as Index of Consumer Sentiment, is based on responses to five questions. In the survey, respondents are questioned about measures of aggregate economic activity, personal income and wealth.

## **2. 1. Consumer Confidence Index in Turkey**

There are two consumer confidence indices in Turkey with correlation above 90%. One of them is calculated by Turkish Statistical Institute (TURKSTAT) and the other one is by a private company; CNBC-e. Both are monthly announced, however, considering the dataset used in the analysis, CNBC-e<sup>3</sup> CCI is employed since it is announced earlier which renders the index more dynamic and practical. The data are available from CNBC-e/NTVMSNBC<sup>4</sup> website.

The survey and the methodology of CNBC-e CCI are adopted from consumer sentiment index of Michigan University. 3 out of 5 of these questions are about the current state compared to previous and the rest are about future. The first two questions are about personal financial situation and the rest are about Turkish economy. CCI data is constructed via surveys including such questions that aim to measure the likelihood of current/future consumption of the households.

The index is composed of five questions given below:

1. Can you compare your (and your family's) current financial situation with last year?
2. What do you think your (and your family's) future financial situation will be in a year?
3. Can you compare your current expectations about Turkish economy with the previous month?

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<sup>3</sup> CNBC-e CCI goes back to 2002 whereas TURKSTAT data starts by 2003.

<sup>4</sup> <http://www.cnbc.com>, Accessed 9 June 2014

4. What do you think Turkish economy's situation will be in a year?
5. Do you think that the current period is a good time to buy durable consumer goods such as TV, refrigerator and furniture or vehicles or residence?

There are four options for answers, which are: "Better", "Worse", "Same" and "No Idea". CNBC-e index is compiled of 720 completed surveys. The survey data for the next month is obtained from the respondents between the 27th day of the current month and the 26th day of the next month as mentioned in the CNBC-e/NTVMSNBC website<sup>5</sup>. The base point is 100 and the scale ranges between 0 and 200. The index below 100 expresses that the consumers are pessimistic, and the index above 100 expresses that the consumers are optimistic.

### 3. Methodology

Given VAR model with the endogeneous variables represented with the vector  $X_t$ , where each variable is assumed to be stationary:

$$AX_t = C(L)X_t + D\varepsilon_t \quad (3.1)$$

where  $C(L)$  is the lag operator and  $\varepsilon_t$  is *i.i.d.* residuals with  $(0, \sigma^2)$ . Multiplying each side by  $A^{-1}$ , we get the left-hand-side of the equation alone as in (3.2):

$$X_t = A^{-1}C(L)X_{t-1} + A^{-1}D\varepsilon_t \quad (3.2)$$

If  $A$  and  $D$  are known in (3.2), VAR estimation would give us  $C(L)$ , moreover the structural shocks,  $e_t$ , since we can multiply residuals,  $\varepsilon_t$ , from VAR with  $A^{-1}D$ . However,  $A$  and  $D$  are not known. Therefore, identification is needed. In the SVAR methodology identification is attained by imposing contemporaneous restrictions on both the structure of the economy and the stochastic structure of the model.

Keating (1992), regarding SVAR model, states that identification is attained by imposing "theoretical restrictions" in order to have the number of estimated parameters of the variance-covariance matrix of the residuals from VAR either equal to or higher than the number of unknown structural parameters. We have to impose  $n(n-1)/2$  number of theoretical restrictions for full identification.

<sup>5</sup> <http://www.ntvmsnbc.com/id/24932332/>, Accessed 16 June 2014.

## 4. Model and Data

### 4.1. Model

In this section, the relationship between several macroeconomic indicators is examined using SVAR model for Turkish economy. Under the open economy assumption, exchange rate ( $XR_t$ ), international interest rate ( $R_t$ ), oil price ( $oil_t$ ) are incorporated into the model. The empirical model in this study covers seven indicators to better explore the characterization of macroeconomic variables in Turkey. SVAR model is represented by the vector:

$$X_t = [oil_t, R_t, \pi_t, i_t, y_t, CCI_t, XR_t]'$$

Due to the sensitivity of VAR models to order, theoretically the most widely used order is tested. The first two variables are the most exogenous variables for the model in question since they are determined outside the domestic economy. Oil price is assumed to be more exogenous than international interest rate.

Inflation ( $\pi_t$ ) is assumed to affect interest rate ( $i_t$ ) as the main objective of CBRT is to maintain price stability. Oil price is excluded in the interest rate equation under the assumption that CPI inflation reflects a small ratio of energy prices and that central bank does not monitor oil price in the determination of interest rate. Output ( $y_t$ ) is assumed to be affected from inflation, interest rate and external variables. In addition to inflation, interest rate and external variables, CCI is also assumed to be affected from output.

$$\begin{bmatrix} e_{oil} \\ e_R \\ e_\pi \\ e_i \\ e_y \\ e_{CCI} \\ e_{XR} \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ a_{21} & 1 & 0 & 0 & 0 & 0 & 0 \\ a_{31} & a_{32} & 1 & 0 & 0 & 0 & 0 \\ 0 & a_{42} & a_{43} & 1 & 0 & 0 & 0 \\ a_{51} & a_{52} & a_{53} & a_{54} & 1 & 0 & 0 \\ a_{61} & a_{62} & a_{63} & a_{64} & a_{65} & 1 & 0 \\ a_{71} & a_{72} & a_{73} & a_{74} & a_{75} & a_{76} & 1 \end{bmatrix} \begin{bmatrix} \varepsilon_{oil} \\ \varepsilon_R \\ \varepsilon_\pi \\ \varepsilon_i \\ \varepsilon_y \\ \varepsilon_{CCI} \\ \varepsilon_{XR} \end{bmatrix}$$

where  $e_{oil}$  is OIL PRICE residuals,  $e_R$  is US RATE residuals,  $e_\pi$  is INFLATION residuals,  $e_i$  is INTEREST RATE residuals,  $e_y$  is INDUSTRIAL PRODUCTION residuals,  $e_{CCI}$  is CCI residuals,  $e_{XR}$  is EXCHANGE RATE residuals.



## **4.2. Data**

The focus of the paper is to incorporate CCI into the model. CCI is released in 2002. However, as shown in Figure 1, overnight interest rates fall under 20% from 60% and inflation fall around 10% from 70% after disinflation policy is implemented in 2002. Hence, the period until 2006 April can be interpreted as an adjustment period and removing such a period would be healthier for the analysis.

As for domestic interest rate, short term rate will be effective for the analysis. Prior 2010, overnight rate is the policy rate and after that period one-week repo is the policy rate. In order to be consistent with the central bank policy, overnight rate is used before 2010 May and the average of overnight rate and one-week-repo is used after that period. Interest rate data are obtained from CBRT (Central Bank of Republic of Turkey). As for international interest rate, US interest rate (with federal funds rate the most preferred indicator) is generally used in the literature since US is the main benchmark in international analyses. However, after the 2008 crisis, US federal funds rate falls drastically around 0% (Figure 1) which is a disincentive to include this rate. In order to circumvent the problem of zero-level short term interest rate of the US, long term rate of 10-year bond is employed.

Figure 1 shows the time series in graphs. CCI is CNBC-e's consumer confidence index; oil price is monthly crude oil price<sup>6</sup> from EIA (US Energy Information Administration). Exchange rate is nominal and per US dollar. Inflation rate is annual CPI inflation based on the same month of the previous year. Monthly production is simply the seasonally adjusted industrial production index. Last three variables are obtained from CBRT. The graph below covers the monthly period between 2002:01 and 2012:12 where CCI of CNBC-e is available. However, the sample for SVAR analysis covers the period 2006:04-2012:12. CCI and oil price are in natural logarithmic form.

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<sup>6</sup> US Energy information administration, available at [http://www.eia.gov/dnav/pet/pet\\_pri\\_spt\\_s1\\_m.htm](http://www.eia.gov/dnav/pet/pet_pri_spt_s1_m.htm), Accessed 5 January 2014.

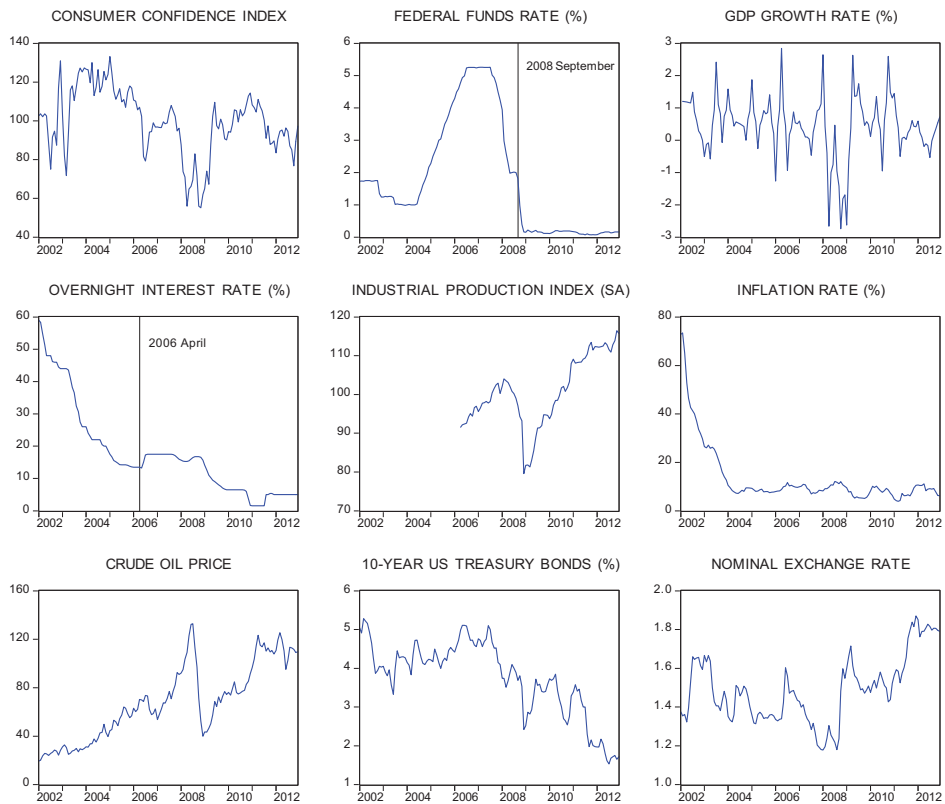
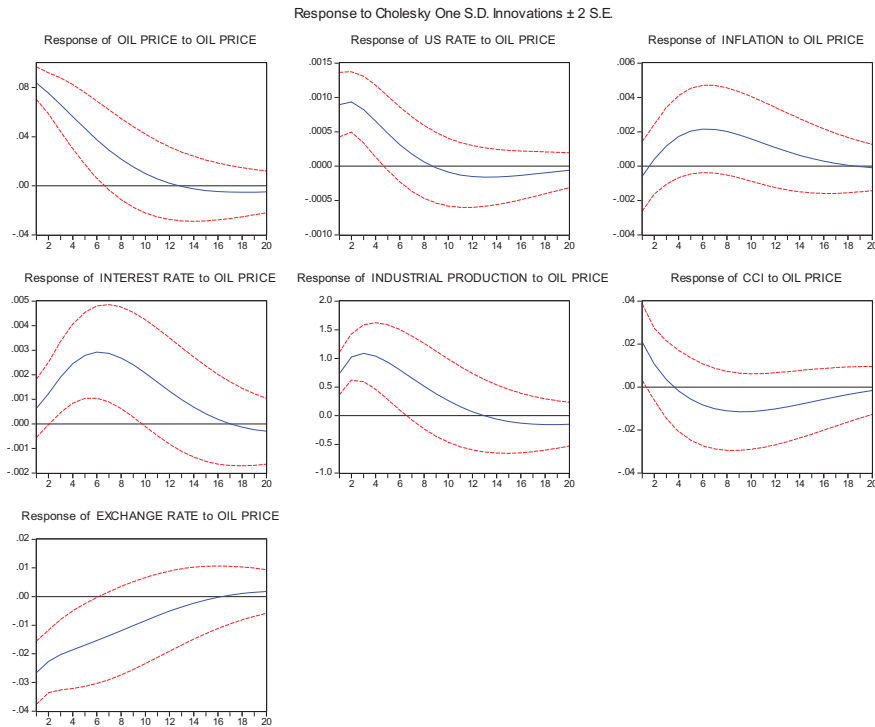


Figure 1: Time graphs of the variables

### 4.3. Empirical Findings

Before SVAR analysis, all variables are Hodrick-Prescott (HP) filtered with  $\lambda = 14400$ . Figures from 2 to 8 depict impulse response functions of seven macroeconomic variables via SVAR analysis. Figure 2 shows the responses to oil price shock. Following a positive oil price shock, US rate, domestic interest rate and production reflect positive responses, whereas CCI reflects a positive response only on impact and exchange rate displays a negative response. The impulse response functions in Figure 3 measure the dynamic effect of a one standard deviation positive shock to US rate (as a benchmark for international interest rate). Inflation rate responds negatively, whereas CCI responds negatively and domestic interest rate positively only on impact. Inflation and domestic interest rate shock in Figures 4 and 5, respectively, depict no significant response by variables in question.

Production shock in Figure 6 only reflects a positive impact on domestic interest rate. One standard deviation positive CCI shock, in Figure 7, reflects a positive response on production and negative response on exchange rate. Lastly, impulse response to exchange rate shock, given in Figure 8, reflects a positive response only on rise in interest rate. Each variable reflects a positive response following its own shock, since it is a positive one standard deviation shock, and the response fades away after a few lag.



**Figure 2:** Impulse Response to Oil Price Shock

Theoretical restriction in the model assumes that oil price is the most exogenous variable, such that it even determines the US rate. Bernanke et al. (1997, 2004) claim that US monetary policy is tightened systematically in response to oil price rise. This may be attributed to the case that high crude oil prices will lead to inflation and lead the monetary authorities raise interest rates (Wang and Chueh, 2013). Relevant impulse response function, in Figure 2, confirms this for the period in question.

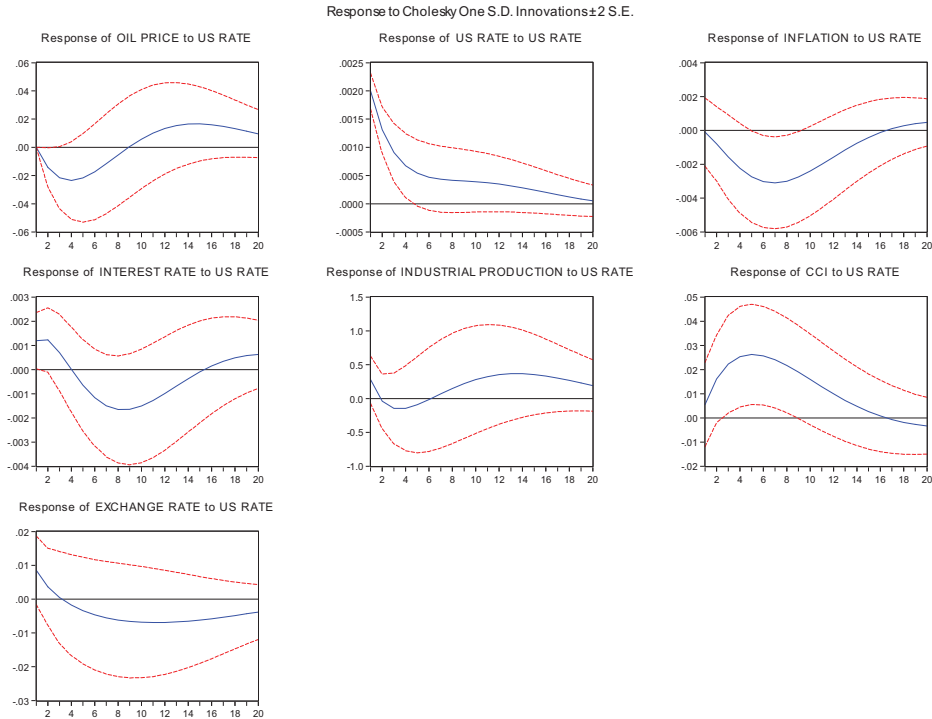
Under normal circumstances, cost of production increases following oil price shock which may easily lead to a rise in producer prices and consequently in consumer prices. In order to deal with the inflation, central bank may intervene by increasing interest rates.

Nevertheless, Figure 2 does not reflect any significant response by inflation but interest rate responds positively and significantly. We may attribute this to the inflationary expectations of the central bank. In fact, for the period in question, it is argued that rise in oil price leads to capital inflows to emerging economies (Arezki and Hasanov, 2007; Wiegand, 2008; Turhan et al., 2012). Hence, oil price shock appreciates domestic currencies against the US dollar which lowers the cost of production with imported intermediate input. Considering the period, rise in oil price both boosts (energy prices rise which is an input for production) and alleviates (appreciation in domestic currency lowers the cost of imported intermediate input) the cost of production which may be an explanation for the insignificance in inflation rate. Turhan et al. (2012), using daily dataset of 2003-2010, examined the relationship between oil price and exchange rate of several emerging economies (including Turkey) against US dollar. Turhan et al. (2012: 21) make an excellent description for the relationship regarding the increased importance of oil price movements after the financial crisis such that as oil prices rise, TL currency depreciates against the US dollar and that this comovement is getting stronger due to the fact that (i) the decline in the price of oil carries fear in the growth prospects of the world economy and increases the outflows from the emerging markets; however, oppositely, emerging economies have recovered faster due to the positive sentiments that oil price rises bring compared to developed countries due to high profit expectations and that capital inflows to the emerging markets, (ii) the strategic changes observed in the mechanism of recycling petrodollars such that the due to the rise in oil revenues of the OPEC countries excess funds were used to be deposited to the international banking system however due to globalization in 2000s', these excess funds are now invested in the financial system and also that oil exporters are investing more of these funds to emerging market economies.

Consistent with Turhan et al. (2012), Figure 2 illustrates that exchange rate appreciates, CCI and industrial production rise following a rise in oil price. Oil exporting Middle East economies recently contribute a lot to the global capital flows due to rise in their current account surpluses. These flows are also directed towards neighbor countries either in the form of portfolio investments or foreign direct investments<sup>7</sup>. Hence, appreciation in Turkish currency may occur due to capital flows from Middle East economies (Aslanoğlu and Deniz, 2013). Such flows may also contribute to the production level of the host economy since emerging economies are generally in need of finance and capital flows help to remove the barriers against growth.

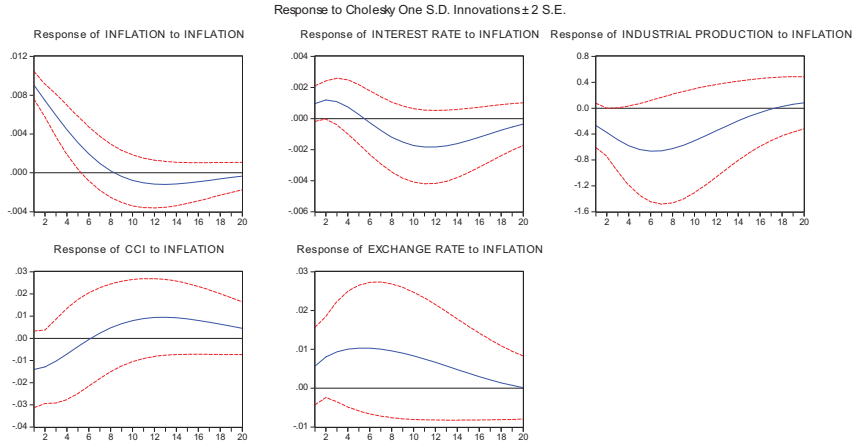
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<sup>7</sup> For instance, in recent years Middle East economies demand investment especially from Turkish construction sector. In the same way, short term capital flows are directed in order to gain from relatively higher interest rates.

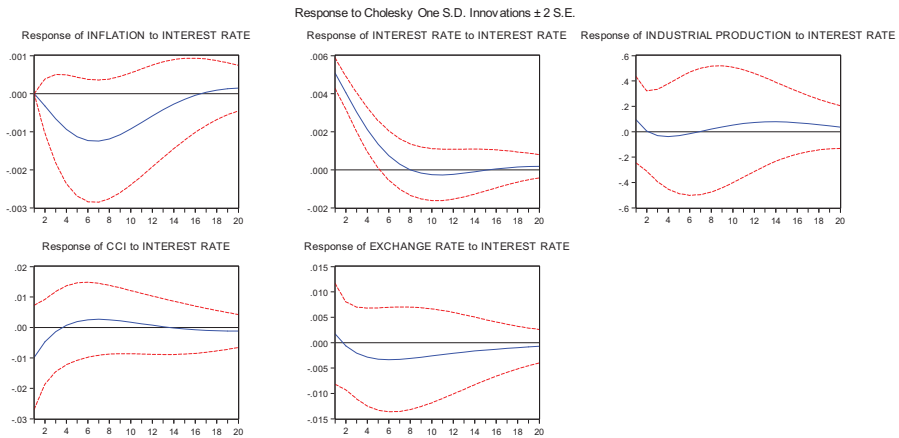


**Figure 3:** Impulse Response to International Interest Rate Shock

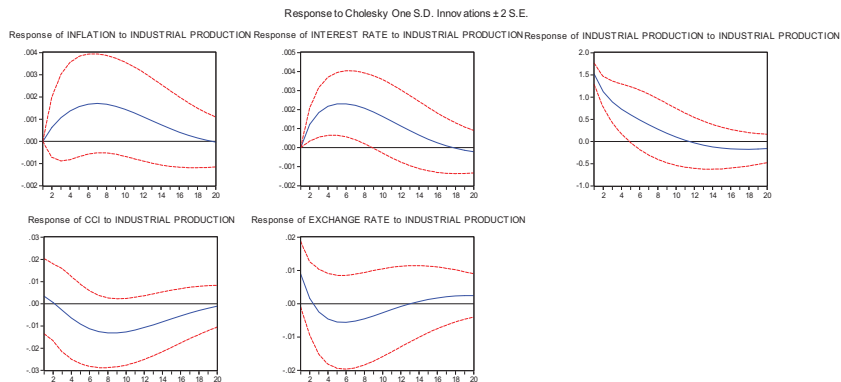
US rate shock, in Figure 3, leads to a positive effect on domestic interest rate (on impact) and CCI, whereas inflation responds negatively. Just as many developing economies, Central Bank of Turkey also follows US rate which implies that Turkish economy is not powerful enough to counteract international interest rates so as to pursue its own economic targets. Monetary policies of small open economies generally pursue international interest rates so as to eliminate the disadvantages of independent monetary policies. The period utilized in the analysis includes the global financial crisis in which the US rates have fallen dramatically. Hence, the international interest rate shock should be considered to be a negative shock, i.e., the US rate is decreasing. Domestic nominal interest rates follow the decline in the US rates. The period in question is a pessimist era leading to a fall in consumer confidence. Inflation rate reflects a negative response, i.e., inverse effect following the US rate shock. Hence, a fall in the US rate leads to a rise in the domestic inflation. This may be attributed to the dependency of Turkish Central Bank to FED which hampers the domestic monetary policy.



**Figure 4: Impulse Response to Inflation Rate Shock**

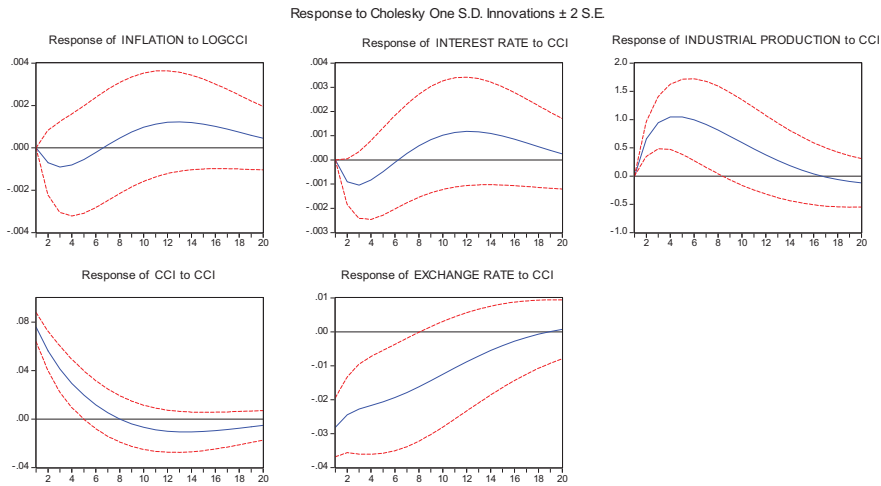


**Figure 5: Impulse Response to Interest Rate Shock**



**Figure 6: Impulse Response to Industrial Production Shock**

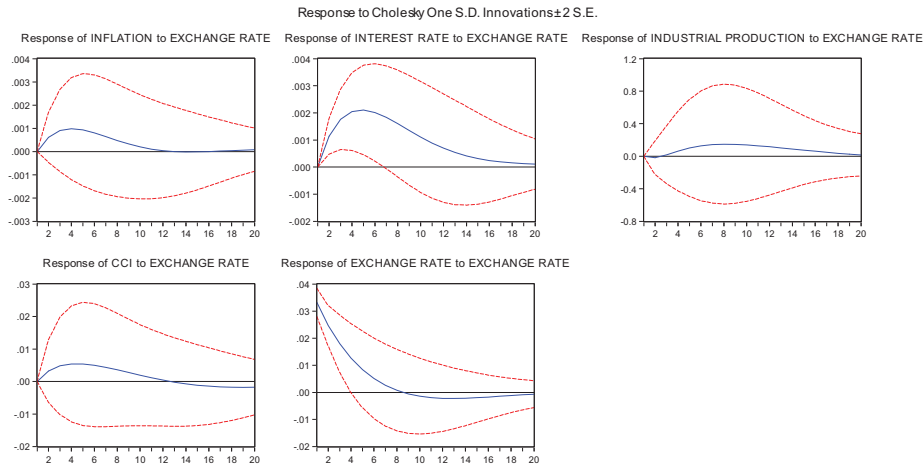
Figure 6 reflects a positive response on domestic interest rate following a shock on industrial production. The relationship may be explained via Taylor rule type of central bank monetary policy. In a standard Taylor rule model, interest rate is determined by output gap and inflation gap where output gap refers to the difference between actual and potential output and inflation gap refers to the difference between inflation and inflation target. Hence, we may attribute the rise in interest rate to the shock where actual output is above potential output level.



**Figure 7:** Impulse Response to CCI Shock

Figure 7 depicts the effect of confidence shock. Rise of production in response to CCI shock may be attributed to the predictive power of CCI or that there can be a self-fulfilling prophecy<sup>8</sup>. When consumers feel optimistic about future, this implies a rise in future consumption expenditure. Moreover, the firms who are able to pursue the consumer sentiments will act accordingly so as to match their supply and demand; and therefore benefit from using their entrepreneurial skills. In other words, a demand-pull production occurs unless the firms neglect short run fluctuations in confidence, i.e., future consumption expenditure. Based on good expectations, they may decide on producing more, employing more factors of production. The figure represents a negative response in exchange rate and interest rate (on impact) following a CCI shock. Rise in confidence to the economy renders the domestic currency stronger leading to an appreciation, i.e., a decline in the exchange rate.

<sup>8</sup> Matsusaka and Sbordone (1995: 297) also mention that expectations can be self-fulfilling in that if people expect bad times they get them.



**Figure 8:** Impulse Response to Exchange Rate Shock

The only significant effect of exchange rate shock is on interest rate, as observed in Figure 8. A rise in exchange rate will increase the cost of import products. This will both affect consumers and firms negatively. A high ratio of production in Turkey is based on import which renders Turkish economy highly dependent on exchange rates. Hence a rise in exchange rate may be destructive for the economy. The primary objective of CBRT is to stabilize inflation rate but implicitly controls exchange rate so as to reduce the deteriorating effects of exchange rate on import/export markets, inflation, production and growth. Positive impact on interest rate suggests the monetary policy intervention following a shock in exchange rate.

## 5. Conclusion

Expectations have been a hot topic in economics literature especially together with the rational expectations hypothesis, which assumes that agents form expectations in a rational way, and that many schools of thought are based on rational expectations. The idea that agents have rational expectations about future is under debate since many studies advocate that future is uncertain. Assuming that all information is available is restricting rather than simplifying. In other words, standard models ignore many imperfections about the economy. However, predicting future is essential and that the recent literature (Akerlof and Shiller, 2009; Barsky and Sims, 2012) have focused on the importance of “animal spirits”, ideas, feelings of agents etc. in explaining economic activity. It is suggested that such information contributes to the predictions about the economy.

CCI is an index that measures the aggregate economic activity, personal income and



wealth through a survey. The index expresses the mood of the consumers, i.e., optimism or pessimism. Importance of CCI in the economics literature as a predictive indicator is increasing. Many studies highlight the role of consumer confidence on economic fundamentals and some even attribute the economic downturns to CCI and that economies can overcome crisis by confidence boosting policy actions (Beaudry and Portier, 2006; Barsky and Sims, 2011; Bachmann and Sims, 2012). In a similar manner, Akerlof and Shiller (2009) argue that declining animal spirits are the basic motive for the recent severe economic crisis. In the study, this link is reduced to the assumption<sup>9</sup> that CCI provides the information in the animal spirits.

Consumer confidence lies at the heart of this paper with the observation that CCI precedes consumption<sup>10</sup> and production. A 7-variable structural VAR analysis including CCI show that consumer confidence shock significantly and positively affects production level. The main argument of the study is that consumer confidence may be utilized as a proxy for animal spirits in the production function of some firms under the assumption that these firms follow their animal spirits in the production process. Animal spirits here define the ability to foresee the mood of the consumers such that consumers that have optimistic mood will consume more – and vice versa- and firms in the competitive market conditions need to anticipate consumer behavior in order to survive.

CCI provides vital information about the economy through the declarations of the consumers regarding their current and future behavior. The increasing importance of CCI should be accepted as an economic indicator and economic researchers should give more place to CCI in their models.

## **References**

- ABEELE, P. Van Den; (1983), “The Index of Consumer Sentiment: Predictability and Predictive Power in the EEC”, *Journal of Economic Psychology*, 3, pp. 1-17.
- ACEMOGLU, Daron and Andrew SCOTT; (1994), “Consumer Confidence and Rational Expectations: Are Agents Beliefs Consistent with the Theory?” *Economic Journal*, 104, pp.1-19.
- AHMED, Huson Joher Ali and IKM Mokhtarul WADUD; (2011), “Role of oil price shocks on macroeconomic activities: An SVAR approach to the Malaysian economy and monetary responses”, *Energy policy*, 39(12), pp. 8062-8069.

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<sup>9</sup> In fact, CCI has long been used as a proxy for animal spirits, as mentioned in the introduction chapter.

<sup>10</sup> Consumption expenditures constitute the largest share (around 60% over all economies) of GDP reflecting that understanding consumption brings about crucial information about the economy.

- AKERLOF, George A. and Robert J. SHILLER; (2009), *Animal Spirits: How Human Psychology Drives the Economy, and Why It Matters for Global Capitalism*, Princeton University Press.
- ASLANOĞLU, Erhan and Pinar DENİZ; (2013), *Oil Prices Once Again: The Link Towards Middle East Economies*. *Topics in Middle Eastern and African Economies*, 15.2, 22-41. <http://www.luc.edu/orgs/meca/volume15/pdfs/Oil-Prices-Once-Again.pdf> (22 January 2014).
- BACHMANN, R. and E. R. SIMS; (2012), “Confidence and the transmission of government spending shocks”, *Journal of Monetary Economics*, 59(3), pp. 235-249.
- BARSKY, R. B. and E.R. SIMS; (2012), “Information, animal spirits, and the meaning of innovations in consumer confidence”, *American Economic Review*, 102(4), pp. 1343-77.
- BARSKY, R.B. and E.R. SIMS; (2011), “News shocks and business cycles”, *Journal of Monetary Economics*, 58, pp. 273–289.
- BASHER, S. A., A.A. HAUG and P. SADORSKY. (2012). “Oil prices, exchange rates and emerging stock markets”, *Energy Economics*, 34(1), pp. 227-240.
- BEAUDRY, P. and F. PORTIER. (2006). “News, stock prices, and economic fluctuations”, *American Economic Review*, 96(4), pp. 1293–1307.
- BERNANKE, Ben; (10 March 2005), *The Global Saving Glut and the U.S. Current Account Deficit*. <http://www.federalreserve.gov/boarddocs/speeches/2005/200503102/>, 23.01.2014.
- BERNANKE, Ben; (1986), *Alternative explanations of the money-income correlation*. NBER Working Paper. No. 1842, <http://www.nber.org/papers/w1842.pdf>, 22.06.2013.
- BERNANKE, Ben, Mark GERTLER and Mark W. WATSON; (1997), “Systematic monetary policy and the effects of oil price shocks”, *Brookings Papers on Economic Activity*, pp. 91–157.
- BERNANKE, Ben, Mark GERTLER and Mark W. WATSON; (2004). “Reply: Oil shocks and aggregate macroeconomic behavior: the role of monetary policy”, *Journal of Money, Credit and Banking*, pp. 287–291.
- BHUIYAN, Rokon and Robert F. LUCAS; (2007), “Real and nominal effects of monetary policy shocks”, *Canadian Journal of Economics/Revue canadienne d'économique*, 40(2), pp. 679-702.
- BERNANKE, Ben S. and Ilian MIHOV; (1998), “Measuring monetary policy”, *The Quarterly Journal of Economics*, 113(3), pp. 869-902.
- BLANCHARD, Olivier; (1993), “Consumption and the Recession of 1990-1991”, *American Economic Review*, pp. 270-274.
- BLANCHARD, Olivier and Mark W. WATSON; (1986). *Are business cycles all alike?*. R.J. Gordon (Ed.) *American business cycle: Continuity and change*: University of Chicago Press, 1986, pp. 123-180.
- BRAM, Jason and Sydney C. LUDVIGSON; (1998), “Does Consumer Confidence Forecast Household Expenditures? A Sentiment Index Horse Race”, *Federal Reserve Bank of New York Economic Policy Review*, 4, pp. 59-78.
- CARROLL, Christopher D., Jeffrey C. FUHRER and David W. WILCOX; (1994), “Does Consumer Sentiment Forecast Household Spending? If So, Why?”, *American Economic Review*, 84, pp. 1397-1408.
- CHOI, Woon Gyu; (1999), “Asymmetric monetary effects on interest rates across monetary policy stances”, *Journal of Money, Credit and Banking*, 31(3), pp. 386-416.
- CHRISTIANO, Lawrence J., Martin EICHENBAUM and Charles EVANS; (1994), *The effects of*

- monetary policy shocks: some evidence from the flow of funds. National Bureau of Economic Research, No. w4699. <http://www.nber.org/papers/w4699.pdf>, 11.04.2013.
- DOĞRUL, H. Günsel and Ugur SOYTAS; (2010), "Relationship between oil prices, interest rate, and unemployment: Evidence from an emerging market", *Energy Economics*, 32(6), pp. 1523-1528.
- EICHENBAUM, Martin; (1992), "Interpreting the macroeconomic time series facts: The effects of monetary policy' by Christopher Sims", *European Economic Review*, 36(5), pp. 1001-1011.
- FRANKEL, Jeffrey, David PARSLEY and Shang-Jin WEI; (2005), *Slow Pass-through around the World: A New Import for Developing Countries?*. NBER Working Paper. w11199. <http://www.nber.org/papers/w11199.pdf>, 12.06.2013.
- FUHRER, Jeffrey C.; (1993), "What Role Does Consumer Sentiment Play in the U.S. Macroeconomy?", *Federal Reserve Bank of Boston New England Economic Review*, pp. 32-44.
- GARNER, C. Alan; (1991), "Forecasting Consumer Spending: Should Economists Pay Attention to Consumer Confidence Surveys?", *Federal Reserve Bank of Kansas City Economic Review*, pp. 57-71.
- GOLUB, Stephen S.; (1983), "Oil prices and exchange rates", *Economic Journal*, 93(371), pp. 576-93.
- GRILLI, Vittorio and Nouriel ROUBINI; (1996), "Liquidity models in open economies: Theory and empirical evidence", *European Economic Review*, 40(3), pp. 847-859.
- HASANOV, Fuad and Rabah AREZKI; (2009). *Global Imbalances and Petrodollars*. IMF Working Paper. WP/09/89. <http://www.imf.org/external/pubs/ft/wp/2009/wp0989.pdf>, 13.06.2014.
- HÜFNER, Felix P. and Michael SCHRÖDER; (2002), *Forecasting Economic Activity In Germany- How Useful Are Sentiment Indicators?*. Centre for European Economic Research Discussion Paper. No. 02-56. September, <https://ub-madoc.bib.uni-mannheim.de/389/1/dp0256.pdf>, 23.02.2014.
- KARA, Hakan; (2006), *Turkish Experience With Implicit Inflation Targeting*. Central Bank of the Republic of Turkey. Research and Monetary Policy Department Working Paper, No:06/03, <http://www.tcmb.gov.tr/research/discus/WP0603.pdf>, 23.02.2014.
- KATONA, George; (1951), *Psychological Analysis of Economic Behavior*. New York: McGraw-Hill.
- KEATING, John; (1992), *Structural Approaches to Vector Autoregressions*. Federal Reserve Bank of St. Louis Review. September/October, [http://research.stlouisfed.org/publications/review/92/09/Vector\\_Sep\\_Oct1992.pdf](http://research.stlouisfed.org/publications/review/92/09/Vector_Sep_Oct1992.pdf), 23.01.2011.
- KILIAN, Lutz; (2009), "Not all oil price shocks are alike: Disentangling demand and supply shocks in the crude oil market", *The American Economic Review*, pp. 1053-1069.
- KIM, Soyoung; (2005), "Monetary policy, foreign exchange policy, and delayed overshooting", *Journal of Money, Credit, and Banking*, 37(4), pp. 775-782.
- KWAN, Andy C. and John A. COTSOMITIS; (2006), "The Usefulness of Consumer Confidence in Forecasting Household Spending in Canada: A National and Regional Analysis", *Economic Inquiry*, 44, pp. 185-197.

- LEU, Shawn Chen-Yu; (2011), “A New Keynesian SVAR model of the Australian economy”, *Economic Modelling*, 28(1), pp. 157-168.
- LUDVIGSON, Sydney; (1996), *Consumer Sentiment and Household Expenditure: Reevaluating the Forecasting Equations*. Working Paper. Federal Reserve Bank of New York, [http://www.newyorkfed.org/research/staff\\_reports/research\\_papers/9636.pdf](http://www.newyorkfed.org/research/staff_reports/research_papers/9636.pdf), 06.02.2013.
- LUDVIGSON, Sydney; (2004), “Consumer Confidence and Confidence Spending”, *Journal of Economic Perspectives*, 18, pp. 29-50.
- MATSUSAKA, John G. and Argia M. SBORDONE; (1995), “Consumer Confidence and Economic Fluctuations”, *Economic Inquiry*, 33, pp. 296-318.
- NAZ, Farah, Asma MOHSIN and Khalid ZAMAN; (2012), “Exchange rate pass-through in to inflation: new insights in to the cointegration relationship from Pakistan”, *Economic Modelling*, 29(6), pp. 2205-2221.
- ÖZDEMİR, Gonca Zeynep; (2013), *Tüketici Güveninin Tüketim Harcamaları ile İlişkisi ve Öngörü Gücü: Türkiye Örneği. Uzmanlık Yeterlilik Tezi, Türkiye Cumhuriyet Merkez Bankası*, <http://www.tcmb.gov.tr/kutuphane/TURKCE/tezler/goncaozdemir.pdf>, 15.11.2013.
- ROSSI, Marco and Daniel LEIGH; (2002), *Exchange Rate Pass-Through in Turkey*. IMF Working Paper. WP/02/2004, <http://www.imf.org/external/pubs/ft/wp/2002/wp02204.pdf>, 18.06.2013.
- SIMS, C. A. (1980). “Macroeconomics and reality”, *Econometrica: Journal of the Econometric Society*, pp. 1-48.
- SOUSA, Joao Miguel and Andrea ZAGHINI; (2007), “Global monetary policy shocks in the G5: a SVAR approach”, *Journal of International Financial Markets, Institutions and Money*, 17(5), pp. 403-419.
- STOCK, James H. and Mark W. WATSON; (2001), “Vector autoregressions”, *Journal of Economic perspectives*, pp. 101-115.
- TANG, Weiqi, Libo WU and Zhong Xiang ZHANG; (2010), “Oil price shocks and their short-and long-term effects on the Chinese economy”, *Energy Economics*, 32, pp. 1-12.
- THORBECKE, Willem; (1997), “On stock market returns and monetary policy”, *The Journal of Finance*, 52(2), pp. 635-654.
- TURHAN, Ibrahim, Erk HACIHASANOGLU and Ugur SOYTAS; (2012), *Oil Prices And Emerging Market Exchange Rates*. Central Bank of the Republic of Turkey, Working Paper No: 12/01, <http://www.tcmb.gov.tr/research/discus/2012/WP1201.pdf>, 13.06.2014.
- VOLKAN, Ara, Cem SAATÇIOĞLU and Levent KORAP; (2007), *Impact of exchange rate changes on domestic inflation: the Turkish experience (No. 2007/6)*. Discussion Paper. Turkish Economic Association, <http://www.tek.org.tr/dosyalar/VOLKAN-SAATCI-KORAP.pdf>, 02.01.2013.
- WANG, Yu Shan and Yen Ling CHUEH; (2013), “Dynamic transmission effects between the interest rate, the US dollar, and gold and crude oil prices”, *Economic Modelling*, 30, pp.792-798.
- WIEGAND, Johannes; (2008), *Bank Recycling of Petro Dollars to Emerging Market Economies During the Current Oil Price Boom*. IMF Working Paper. WP/08/180, <https://www.imf.org/external/pubs/ft/wp/2008/wp08180.pdf>, 13.06.2014.