Relationship between oil prices, interest rate, and unemployment: Evidence from an emerging market

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ABSTRACT

While the interrelation between oil price changes, economic activity and employment is an important issue that has been studied mainly for developed countries, little attention has been devoted to inquiries on fluctuations in the price of crude oil and its impact on employment for small open economies. Adopting an efficiency wage model for equilibrium employment that does not require any assumptions regarding labor supply, this paper contributes to the literature by investigating the causality between unemployment and two input prices, namely energy (crude oil) and capital (real interest rate) in an emerging market, Turkey for the period 2005:01–2009:08. Applying a relatively new technique, the Toda–Yamamoto procedure, we find that the real price of oil and interest rate improve the forecasts of unemployment in the long run. This finding supports the hypothesis that labor is a substitute factor of production for capital and energy.

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1. Introduction

Unemployment is an important macroeconomic and political problem all economies confront. Due to its social and economic consequences, it is essential for policy makers to identify the factors that are affecting the unemployment rate the most. Furthermore, policy makers must also realize that the dynamics of unemployment and other factors may differ among countries at different stages of economic development. Developing countries are known to have higher unemployment rates than developed countries, with the former having higher economic growth rates than the latter. High level of unemployment has been also observed in Turkey, playing a major role in both the government’s internal and international economic policies.

Considering unemployment in a supply–demand framework, it can be argued that the level of employment depends on factors such as the productivity of labor, wages, price level, and prices of other factors of production. On a macroeconomic level, unemployment rate will also follow closely the local factors such as the state of the economy, business cycles, the technology level, and population demographics, as well as global factors like energy prices. Policy makers need a clear understanding of the dynamics and microeconomic fundamentals through which factors influence the unemployment rate in the long run, in order to devise sound macroeconomic programs.

In this paper we follow an efficiency wage framework that enables us to theoretically relate real oil price, real interest rate, and unemployment. Applying the Toda–Yamamoto procedure which avoids some of the problems other techniques face, we find that real input prices positively Granger cause unemployment in Turkey. This result is inline with the theory and the results of other studies that mostly focus on developed countries.

2. Theoretical background

Previous studies document various transmission channels through which oil price shocks may have an impact on the economic activity (Davis and Haltiwanger, 2001; Brown and Yucel, 2002; Lardic and Mignon, 2008). First, there is a classical supply side effect according to which an oil price increase leads to reduction in output since the price increases signaling the reduced availability of basic input to production. As a result, growth rate and productivity decline. Slowing productivity growth decreases real wage growth and increases the unemployment rate (Brown and Yücel, 1999, 2002). Oil price shocks can increase the marginal cost of production in many industries reducing the production and thus increasing the unemployment.
another is costly, workers do not relocate immediately but wait for conditions to get better and thus aggregate employment declines. After an oil shock, since the investment determines the potential output capacity in the long run, higher input prices caused by oil price shocks reduce the investments thus output decreases (Brown and Yücel, 2002).

Second transmission channel is the wealth transfer effect emphasizing the shift in purchasing power from oil importing nations to oil exporting nations (Fried and Schultze, 1975; Dohner, 1981). The shift in purchasing power parity leads to reduction in the consumer demand for oil importing nations and increases consumer demand in oil exporting nations. Consequently, world consumer demand for goods produced in oil importing nations is reduced and the world supply of savings is increased. Increasing supply of savings causes real interest rates to decrease. Diminishing world interest rate should stimulate investment that balances the reduction in consumption and leaves aggregate demand unchanged in the oil importing countries. As Brown and Yücel (2002) emphasized, if prices are downward sticky, the reduction in demand for goods produced in oil importing countries will further reduce the GDP growth. If the price level cannot fall, consumption spending will fall more than increases in investments leading to the fall of aggregate demand and further slowing economic growth.

Real balance effect is the third transmission channel discussed by Pierce and Enzler (1974) and Mork (1994). According to the real balance effect, increase in oil prices would lead to increase in money demand. When monetary authorities fail to increase money supply to meet growing money demand, interest rate will rise deteriorating the growth rate. Brown and Yücel (2002) discussed the impact of monetary policy giving more detail.

Inflation effect is another transmission channel which establishes a relationship between domestic inflation and oil prices. When the observed inflation is caused by oil price-increased cost shocks, a contractionary monetary policy can deteriorate the long-term output by increased interest rate and decreased investment (Tang et al., 2009).

The fifth transmission channel works via effects of oil shocks on the labor market by changing relative production costs in some industries. As Loungani (1986) discussed, if the oil price increases are long-lasting, it can change the production structure and have an important impact on unemployment. Oil price shock can increase the marginal cost of production in many sectors that are oil intensive and can motivate firms to adopt new production methods that are less-oil intensive. This change in turn generates capital and labor reallocation across sectors that can affect unemployment in the long run. Since the workers have industry-specific-skill and job search is time consuming, labor absorption process tends to take time increasing the amount of unemployment. In other words, higher dispersion of sectoral shocks cause higher unemployment rate by increasing the amount of labor reallocation.

The classical model of macroeconomics states that the amount of actual employment will be the equilibrium amount that equates the quantity of labor to the quantity of labor supplied given the assumption of perfectly flexible wages and prices. The real wages will adjust to equate the number of available jobs with the number of qualified job applicants. In other words at equilibrium there is no involuntary unemployment. However, the impact of business cycles on employment is greater than the classical theory claimed. Hamilton (1988) investigates a general equilibrium model of unemployment and the business cycle. He points out that a rational expectations equilibrium with flexible prices can exhibit unemployment. The business cycle mechanism explored by Hamilton (1988) brings forth the possibility that an energy price increase would depress consumer purchases of energy using goods. The decline in product demand in return causes cyclical and structural unemployment.

Another dimension through which energy prices may influence unemployment is through the relative prices of factors of production. According to Carruth et al. (1998), the efficiency wage models provide an attractive framework to investigate the relationship between energy prices and employment for at least 3 reasons. First, the criticism regarding the different relative sizes of changes in wages and employment in classical models is avoided. Second, it allows voluntary unemployment. The third reason is the most important one that is also motivating this paper. That is, the link between unemployment and other factor prices, including oil, has a theoretical explanation in the efficiency wage framework. Carruth et al. (1998) point out that without any assumptions regarding the elasticity of labor supply, the change in the equilibrium in labor market can be attributed to demand changes triggered by changes in input prices.

Probably, except only for Carruth et al. (1998), efficiency wage models either ignore energy or treat it as a secondary input in the production process. Beaudreau (2005) however, argues that energy must be considered as a primary factor of production, as no work is possible without energy from an engineering point of view.2 We follow the efficiency wage model proposed by Carruth et al. (1998). Their model starts with the following wage equation from Shapiro and Stiglitz (1984) (see Carruth et al. (1998) for the derivation of Eqs. (1) and (2):

$$\log w = \log b + f + \frac{s x f}{1 - p(u)(1 - s)}$$

(1)

Where, $w$ is the wage rate, $b$ represents any unemployment benefits, $f$ is effort, $s$ is the probability of shirking successfully, $u$ is the unemployment rate, and $p(u)$ is the probability by which an unemployed person finds a job. Assuming constant returns to scale production function which is homogeneous of degree one and perfect competition in the final good market, Carruth et al. (1998) show that there exists a relationship between real input prices.

$$\mu = C(w, r, ep).$$

(2)

Here, the interest rate $r$ reflects the capital rental rate and $ep$ is the energy price. Carruth et al. (1998) derive the equilibrium unemployment rate from Eqs. (1) and (2):

$$U^* = U^*(r, ep, b(\mu), f, s).$$

(3)

As a result of comparative static analysis Carruth et al. (1998) show that the equilibrium unemployment rate depends on the real interest rate and the real energy price; whereas, it is neutral to total supply and technology. A rise in oil price erodes profits and the economy must adjust to equilibrium where there are no economic profits or losses. Assuming that workers do not shirk, this adjustment takes place through an increase in equilibrium unemployment because wages and unemployment are inversely related. A similar adjustment also takes place when interest rates rise. Carruth et al. (1998) see unemployment as a “discipline device”. As real input prices rise, wages decline leading to higher unemployment rates.

Following the Carruth et al. (1998) model we investigate the relationship between the unemployment rate, real energy prices, and the real interest rate in Turkey.

3. Empirical evidence

There are several studies addressing the relationship between oil price changes and employment directly for developed countries. Using a dispersion index from 1947 to 1982 for 28 industries, Loungani (1986) examines the effect of world oil market disruptions on the reallocation process in the U.S. labor market. His analysis shows that oil price increases in the 1950s and 1970s seem to account for unusual amount of labor reallocated across industries thereby increasing the unemployment

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2. Stern (2000) is probably the first to consider energy in a multivariate production function along with labor and capital.
rate in those periods. Hamilton (1983) finds that oil price change has a strong causal and negative correlation with real GNP growth and positive correlation with unemployment from 1948 to 1980 in the U.S.A. using Granger causality. When the sample period is extended to 1988:2 the correlation becomes only marginally significant and more importantly that there is an asymmetry in effects. Using different data and methods, Burbidge and Harrison (1984) examine the impact of oil price shocks on some macroeconomic variables for developed countries such as Canada, U.K., Japan and Germany using VAR models. They show that the 1973–1974 oil embargo explains a substantial part of the behavior of industrial production in the countries examined. However, for the oil price changes in 1979–1980, they find little evidence that the changes in oil prices had an effect on industrial production. Using Hamilton’s data Gisser and Goodwin (1986) examine the relationship between crude oil price shocks and employment. They also search whether oil price shocks have a different effect on the macro economy before 1973 than after but their empirical findings do not support the hypothesis. They find similar results with Hamilton (1983) and Burbidge and Harrison (1984) for the relationship between oil prices and unemployment. Uri (1996) studies the effect of changes in the price of crude oil on agricultural employment in the USA for the period 1947–1995 using Granger causality. He documents a significant empirical relationship between the variables. Using annual data, Mory (1993) shows that rise and fall of the real oil prices have asymmetric effects on output and unemployment in the US from 1951 to 1990. As parallel to other studies in the literature, Hooker (1996) finds that the explanatory power of oil shocks on macro variables diminishes as the sample is further updated. Lee et al. (1995) results suggest that the real oil price shock variable is statistically significant in explaining GNP growth and unemployment over different sample periods. Their results imply that the impact of sudden jumps in oil prices on GNP growth and unemployment is greater in an environment where oil prices are stable before the increases. Applying several different filters, Ewing and Thompson (2007) find that oil prices are negatively and contemporaneously correlated with unemployment cycles in the U.S. Andreopoulos (2009), using quarterly U.S. data from 1953:2 to 2007:2 and applying the Markov Switching Vector Autoregression, examines the causality between unemployment and real input prices, the real prices of energy (crude oil) and capital (real interest rate). His results show that the real price of oil helps forecast unemployment in recessions only, while the real interest rate forecast unemployment in expansions. The common feature of the studies above is that they study the relationship between oil price shocks and employment in developed countries, mostly in the U.S. These studies generally show that the effects of oil price increases and decreases have asymmetric effects on the economy and effects vary across time and countries. The literature on developing countries is not as deep. In an analysis of the Greek economy Papapetrou (2001) confirms the immediate and negative effect of an oil price shock on employment using monthly data for the period 1989:1 to 1999:6. Employing VAR analysis, it is also argued that oil prices play an important role in affecting economic activity and employment and oil price shocks explain a significant proportion of the fluctuations in output growth and employment growth. Robalo and Salvador (2008) conduct a related study for the Portuguese economy. Using the VAR methodology and different specifications of oil price variations, they find a significant effect of variations on the price of oil over the unemployment rate for the first time interval (1968–1985). The magnitude of the coefficients become smaller for the second sub sample (1986–2005) indicating the change of the nature of the relationship between all economic variables and oil price shocks for Portugal from the 1980s on as for most industrialized countries.

Empirical studies for the Turkish economy generally focus attention on energy demand and its effect on output and prices or the relation between stock returns, crude oil prices, interest rates and output (see for example Soytas and Sari, 2003; Sari and Soytas, 2004, 2005, 2006; Alper and Torul, 2008). Sari and Soytas (2005) results seem to differ from the literature since oil price shocks do not appear to have significant impact on real stock returns in the Istanbul Stock Exchange. Alper and Torul’s (2008) study is probably the first to report for Turkey that the negative response of real output to oil price increases have decreased since the early 2000s. But in addition to using standard variables such as oil price changes and real output growth, they also include variables to account for global liquidity conditions. When they include the global liquidity conditions in their model, the impact of oil price changes on aggregate economic activity becomes significant even in the post-2000 period.

As can be understood from the studies on Turkey, the relationship between oil price changes, unemployment and real interest rate for the Turkish economy is not directly addressed. The aim of this paper is to fill this gap. van Wijnbergen (1985) argues that unemployment due to oil price shock in 1974 was neoclassical in developed countries, but Keynesian in less developed countries. This suggests that the dynamic link between oil prices and unemployment differs for countries at different levels of development. Hence, individual country studies may prove to be fruitful. In that respect, following the model of Carruth et al. (1998), we focus on the link between unemployment and real input prices in Turkey. Our study differs from Carruth et al. (1998) in at least two aspects. First, we examine the equilibrium unemployment rate and real input prices in an emerging market, Turkey. Second, we apply a procedure which does not necessitate estimation of a cointegration equation (hence there is no risk of carrying any bias in the estimation procedure further in the analysis) and can be applied even if the series are integrated of arbitrary orders (Toda and Yamamoto, 1995). Our results are, nevertheless, consistent with Carruth et al. (1998) results for the US.

4. Data properties and the empirical model

In this paper, based on the efficiency wage model of Carruth et al. (1998), our aim is to examine the dynamic relationship between oil prices, unemployment rate and real interest rate in Turkey. We employ the relatively new time series technique known as the Toda–Yamamoto (TY) procedure (Toda and Yamamoto, 1995) to test for a long run Granger causality between the series. Since there are no differences terms in any of the equations in this procedure, in the literature the results due to this procedure are referred to as long run Granger causality. To explore the relationship between the real interest rate, the real price of energy and the unemployment rate, we use monthly data from 2005:1 to 2009:8 (56 observations) where 2005:1 is the earliest date for which monthly unemployment rates are available. The unemployment rate (UNEMP) and oil price (OPRICE) data are taken from IMF’s data base, interest rate (TBILL) data is from the Public Finance Statistics reported by the Undersecretariat of Treasury in Turkey. The real interest measure is an auction-accepted average Treasury bill rates deflated by consumer price index.\(^3\) Unemployment is the civilian unemployment rate in percent and the oil price series is the U.S. dollar per barrel market price of crude oil deflated by consumer price indexes. All data are used in natural logarithms.

Toda and Yamamoto (TY) tests are valid for variables that have arbitrary orders of integration and unlike the Johansen-Juselius procedure it does not necessitate a pre-test for cointegration. The TY procedure requires the knowledge on the maximum order of integration that the series in concern have. In order to assess the stationarity properties of the variables employed, we utilized 5 different unit root tests; augmented Dickey Fuller (ADF), Phillips and Perron (1988) (PP), Elliot et al. (1996) Dickey-Fuller GLS detrended (DF-GLS) and Point Oimal (ERS-SPO), Kwiatkowski et al. (1992) (KPSS), and Ng and Perron’s (2001) MZ\(_n\) (NP).\(^4\) The results of the unit root tests are in Table 1.

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\(^3\) We considered alternative interest rates, but the results are insensitive to different interest rates.

\(^4\) See Maddala and Kim (1998) for an excellent treatment of ADF, PP, KPSS, and DF-GLS; and Ng and Perron (2001) for more on NP.
Based on the results in Table 1, although there are slightly conflicting results, we can safely assume that the maximum order of integration is 1 (d = 1). Since all series appear to be I(1), we proceed with the TY procedure. The procedure involves a VAR in levels; therefore, there is no loss of information due to differencing. A Wald test is conducted on the first k parameters of augmented VAR(k + d) model and the statistic follows an asymptotic Chi-square distribution with k degrees of freedom ($X^2(k)$). In our case, optimum lag length k is determined to be 2 by final prediction error (FPE) and likelihood ratio test (LR). Hence, when we augment the VAR with maximum order of integration, the lag length becomes 3 (k + d = 3). The estimated VAR (3) system is as below:

$$V_t = \alpha_v + \beta_1 V_{t-1} + \beta_2 V_{t-2} + \beta_3 V_{t-3} + e_{vt} \quad (4)$$

where $V_t = (\text{UNEMP}, \text{OPRICE}, \text{TBILL})'$, $\alpha_v$ is a $(3 \times 1)$ vector of constants, $\beta_1$, $\beta_2$, $\beta_3$ are $(3 \times 3)$ coefficient matrices, and $e_{vt}$ denotes white noise residuals.

In addition to checking the stability of the VAR, we subject all equations in the VAR to a series of diagnostic tests to assess the conformity to common assumptions. The diagnostic test results are summarized in Table 2.

As Table 2 shows, there are violations of the heteroscedasticity assumptions, especially for the unemployment equation. The Breusch–Godfrey (BG) test statistics appear to be significant for the first and second equations at 1% and 10% significant level. There is also evidence of an ARCH effect. Lagrange multiplier test for autoregressive conditional heteroscedasticity (ARCH LM) reveals problems with the first and second equations. There is no evidence of parameter instability as indicated by Ramsey RESET tests for all equations. Furthermore, the Chow breakpoint tests indicate that the equations are robust with respect to a possible break in 2008:06 and 2008:07 due to oil crisis. The VAR(3) satisfies the stability condition in that no roots are outside the unit circle. Hence, these diagnostic test results allow us to confidently apply the Wald test for Granger causality.

5. Long run granger causality and generalized impulse responses

The Granger causality framework allows for testing the existence and the direction of causality between variables. The TY procedure allows us to conduct long run Granger causality tests without any need for testing cointegration and estimating the cointegration equation. The test results are based on the first k lags in Eq. (4) for each variable and are summarized in Table 3.

We observe that there are only two significant results. Oil price and interest rate Granger cause unemployment in the long run. Hence, knowledge of real price of oil and interest rate may improve the forecasts of the unemployment rate. The reverse does not hold, therefore the causality is not bi-directional. Our finding of the positive link between energy price and unemployment is inline with Papapetrou (2001) who found the causality between oil price and employment in Greece. However, Andreopoulos (2009) argue that only in recessions that the real price of oil forecasts the unemployment in the US. Hence, our results support the hypothesis that changes in the input prices affect unemployment in the case of the Turkey. Our overall results also confirm the efficiency wage framework, in that increases in the real prices of other inputs lead the unemployment rate to rise.

Table 1: Unit root test results.

<table>
<thead>
<tr>
<th></th>
<th>ADF</th>
<th>ADF GLS</th>
<th>PP</th>
<th>KPSS</th>
<th>NP-Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levels</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>OPRICE</td>
<td>-3.076871b (2)</td>
<td>-2.321248b (1)</td>
<td>-2.257319</td>
<td>0.112515a</td>
</tr>
<tr>
<td></td>
<td>UNEMP</td>
<td>-1.501397 (0)</td>
<td>-1.511736 (0)</td>
<td>-1.900218</td>
<td>0.398689a</td>
</tr>
<tr>
<td></td>
<td>TBILL</td>
<td>0.381763a (1)</td>
<td>0.929404a (1)</td>
<td>0.239047</td>
<td>0.567551a</td>
</tr>
<tr>
<td>Intercept and trend</td>
<td>OPRICE</td>
<td>-3.050036a (2)</td>
<td>-3.032816a (2)</td>
<td>-2.271704</td>
<td>0.110694a</td>
</tr>
<tr>
<td></td>
<td>UNEMP</td>
<td>-2.260552 (0)</td>
<td>-1.905750 (0)</td>
<td>-2.559470</td>
<td>0.165247a</td>
</tr>
<tr>
<td></td>
<td>TBILL</td>
<td>-0.018190 (0)</td>
<td>-1.277840a (1)</td>
<td>-0.616249</td>
<td>0.142624a</td>
</tr>
</tbody>
</table>

First differences

|                      | OPRICE  | -4.254035a (0) | -4.187690a (0) | -4.205351a | 0.075181a | -22.0422a (0) |
|                      | UNEMP | -5.802912a (2) | -5.781488a (0) | -5.802912a | 0.130561a | -28.1417a (0) |
|                      | TBILL | -5.08112a (0) | -3.913235a (0) | -5.014046a | 0.228086a | -16.9263a (0) |
|                      | OPRICE  | -4.207325a (0) | -4.322329a (0) | -4.224333a | 0.047208a | -21.3494b (0) |
|                      | UNEMP | -5.870748a (0) | -5.918339a (0) | -5.866548a | 0.035078a | -26.4414b (0) |
|                      | TBILL | -5.286137a (0) | -4.778387a (0) | -5.210917a | 0.140217a | -21.5348b (0) |

All variables in natural logs, lag lengths are determined via SIC and are in parentheses. The null of all tests are unit roots, except for KPSS. a Indicates significance at 1%. b Indicates significance at 5%. c Indicates significance at 10%.

Table 2: Diagnostic test results.

<table>
<thead>
<tr>
<th></th>
<th>Eq._adj. R²</th>
<th>B-G test</th>
<th>ARCH LM</th>
<th>Ramsey RESET</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNEMP</td>
<td>0.8032329</td>
<td>4.1780a</td>
<td>10.9007(2)b</td>
<td>0.36704</td>
</tr>
<tr>
<td>OPRICE</td>
<td>0.887985a</td>
<td>0.4248a</td>
<td>12.9081(2)b</td>
<td>0.71739</td>
</tr>
<tr>
<td>TBILL</td>
<td>0.922550a</td>
<td>2.0098a</td>
<td>3.8734(2)</td>
<td>1.38095</td>
</tr>
</tbody>
</table>

a Indicates significance at 1%. b Indicates significance at 10%.

Table 3: Granger causality test results.

<table>
<thead>
<tr>
<th></th>
<th>To</th>
<th>Test statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNEMP</td>
<td>OPRICE</td>
<td>UNEMP</td>
<td>6.3535</td>
</tr>
<tr>
<td>TBILL</td>
<td>UNEMP</td>
<td>OPRICE</td>
<td>1.3695</td>
</tr>
<tr>
<td>TBILL</td>
<td>UNEMP</td>
<td>TBILL</td>
<td>16.0809</td>
</tr>
<tr>
<td>OPRICE</td>
<td>TBILL</td>
<td>OPRICE</td>
<td>1.1773</td>
</tr>
<tr>
<td>UNEMP</td>
<td>OPRICE</td>
<td>UNEMP</td>
<td>0.4274</td>
</tr>
<tr>
<td>TBILL</td>
<td>UNEMP</td>
<td>TBILL</td>
<td>1.3723</td>
</tr>
</tbody>
</table>

The test statistics follow a $X^2$ distribution with 2 degrees of freedom. a Indicates significance at 5%. b Indicates significance at 1%.
The TY procedure is a way to examine the long run Granger causality relationship among the series. However, it does not provide information on how each variable responds to innovations in other variables, and whether the shock is permanent or not. This can be done via generalized impulse response analysis by Koop, et al. (1996) and Pesaran and Shin (1998). The generalized impulse response analysis does not suffer from the orthogonality critique and the results are not sensitive to the ordering of the variables in the VAR, which are the main problems faced by traditional impulse responses. Figs. 1 to 3 show the responses of unemployment, oil price and interest rate to one standard deviation shocks to other variables in the VAR. In all figures, the impacts tend to die off rapidly. It is clear from an examination of Fig. 1 that shocks to oil price and interest rate have respectively negative and insignificant initial impacts on unemployment. Shocks in oil price have positive impact on interest rate and tend to die off quickly. Shocks in the unemployment have initially negative significant impact on oil price and then become insignificant.

6. Conclusions

This paper investigates the relationship between oil prices, unemployment and interest rate in Turkey based on an efficiency wage model of Carruth et al. (1998). A considerable body of economic literature indicates the adverse economic impact of oil price shocks for the developed economies. But, there are not enough empirical studies on Turkey and other developing countries. By employing the TY procedure, we were able to support the evidence that input prices, including oil price, affect the unemployment in Turkey. Our results suggest that in the long run both the real price of oil and the real interest rate have an effect on the unemployment rate in Turkey, confirming Carruth, et al. (1998) results for the U.S. The Andreopoulos (2009) results for U.S. during recessions are also similar. Our results also suggest that labor is a substitute factor of production for capital and energy in Turkey. We understand that oil shocks operate mainly through conventional aggregate channels, transmitting oil price increases to the labor market.
in Turkey, as Hamilton (1988) suggested. This study brings forth a question of whether the theory also holds for other developing countries.

References