

## The Relationship between GDP and Unemployment: Evidence from MENA Countries

*Mehdi Haririan\**

*Mehmet Huseyin Bilgin\*\**

*Gokhan Karabulut\*\*\**

**Abstract:** This paper investigates the long-run relationship between GDP growth and unemployment for the following selected MENA countries: Turkey, Egypt, Israel, and Jordan. Although the results of previous studies in this area are somewhat ambiguous, the literature has traditionally shown a negative relationship between GDP growth and unemployment. In this paper, we expect a negative long-run relationship between GDP growth and unemployment to exist. Therefore, we predict that high rates of GDP growth will lead to a reduction in unemployment. The results of our cross-country comparison model support a negative relationship between these variables.

**Keywords:** growth, unemployment, Okun's Law, MENA, Turkey

**JEL Classification:** E24, J69, O49, O53, O57

### Introduction

In many countries, unemployment rates have increased dramatically in recent decades, and the unemployment problem is rapidly assuming dangerous proportions. It is clear that there have been many reasons for the increase in unemployment. The two most important of these factors are weak economic performance and problems with labour market structure. In other words, the problem has both macroeconomic and structural dimensions. Because of these factors, many economies have been unable to create sufficient jobs to absorb all the additional job seekers.

---

\* Mehdi Haririan is at Bloomsburg University, USA.

\*\* Mehmet Huseyin Bilgin is at Kadir Has University, Turkey.

\*\*\* Gokhan Karabulut is at Istanbul University, Turkey.

Unemployment has remained a worrisome problem at the global level. Despite strong global economic growth in 2006, the global unemployment rate remained unchanged from the previous year, at 6.3 percent. According to the International Labour Organization (ILO, 2007), in 2006, there were more people working than in 2005, but there were also more unemployed people. Moreover, in 2007, 5.2 percent global economic growth created an estimated 45 million new jobs, but failed to have any significant impact on the unemployment. Although the global unemployment rate remained stable at around 6 percent, 189.9 million people were unemployed worldwide in 2007, compared to 187 million in 2006.

Furthermore, recent trends in the labour market are also worrisome. Unemployment has been rising sharply in many countries since March 2008 as a result of the global economic crisis. Large-scale job losses continue to be reported in many economies. Moreover, the ILO (2009) estimated that global unemployment could increase by between 29 million (lowest scenario) and 59 million (highest scenario) unemployed people in 2009 versus 2007, with a middle scenario of 39 million.

The unemployment rate varies among different regions of the world. However, in 2006, with 12.2 percent unemployment, the Middle East and North Africa (MENA)<sup>1</sup> stood out as the region with the world's highest unemployment rate. The ILO observed that the Middle East and North Africa maintained the world's highest unemployment rates in 2007, at 11.8 and 10.9 percent, respectively. According to unofficial estimates, the unemployment rate may in fact be much higher. Nabli (2004) claimed that unemployment is actually likely to be much higher than reported data. Yousef (2004) presented a conservative estimate that places unemployment in the region at about 15 percent of the labour force. Raphaeli (2006) mentioned that the Arab League Economic Unity Council estimates unemployment in the Middle East<sup>2</sup> at 20 percent.

The MENA region covers a range of economies with varied economic structures and labour markets. It appears that there are some economic differences between oil-producing and non-oil-producing countries in the region. However, today, MENA countries share many social and economic problems. It can be said that one of the most important economic and social problems of the MENA region as a whole is the high rate of unemployment. For this reason, there is a common belief among economists that there is a strong inverse relationship between the GDP growth and unemployment in the region. It is clear that there are macroeconomic and structural dimensions of unemployment in MENA. Therefore, this assumed link between GDP growth and unemployment may not actually exist in the region. This paper is therefore designed to help clarify the long-run relationship between these variables in the region.

The remainder of the paper is structured as follows. In Section 2, the relationship between GDP growth and unemployment is investigated theoretically. In Section 3, informative details about the labour markets in the countries analyzed in this paper are briefly described. The relationship between GDP growth and unemployment is then analyzed empirically for selected MENA countries. In the final section, the results of the study are evaluated.

## Literature Review

Many studies have analyzed the effects of GDP growth on unemployment. As Carre and Drouot (2004) stated, ‘economists have been interested in studying the relationship between growth and unemployment at least since the beginning of the industrial revolution.’ However, Carmeci and Mauro (2003) argued that, from a theoretical point of view, the relationship between GDP growth and unemployment would not have been an interesting issue until the 1990s. Though in the 1960s and 70s such a relationship was clear and undisputed (Walterskirchen, 1999), today the link between unemployment and growth is a topic of vital interest. In recent economic literature, ‘several ideas have been offered to account for the impact of growth on employment and the other way around’ (Hetze, 2006).

As Fanati and Manfredi (2003) reported, ‘the literature has traditionally shown a negative relation between unemployment and growth.’ Adanu (2002) argued that ‘the fundamental inverse relationship between unemployment and growth has been known to economists for a very long time.’ According to Cuaresma (2003), changes in GDP growth can cause asymmetric changes in the unemployment rate. The author claimed that ‘the negative relationship between output and unemployment may take a nonlinear form.’ Numerous other studies have also investigated this relationship empirically (e.g. Aghion and Howitt, 1994; Carre and Drouot, 2004; Adanu, 2002; Christopoulos, 2004; Cuaresma, 2003; Harris and Silverstone, 2001; Malley and Molana, 2007; and Muscatelli and Tirelli, 2001).

The relationship between the unemployment rate and GDP growth is commonly believed to be governed by Okun’s Law (Malley and Molana, 2007). As Adanu (2002) noted, Arthur Okun (1962) quantified the inverse relationship between unemployment and output, using U.S. GNP data. He argued that there was a stable relationship between GDP growth and the unemployment rate. This relationship is known as ‘Okun’s Law’, and is among the most famous ideas in macroeconomic theory. In his original research, Okun found that an increase in the GDP growth rate by 3 percent (above the normal rate) was expected to reduce the unemployment rate by 1 percentage point (Walterskirchen, 1999; Altig, Fitzgerald, and Rupert, 1997). More recently, this law has been modified to state that for every 1 percent of

unemployment above the natural rate, a 2 percent GDP gap occurs. Within such a framework, a drop in the unemployment rate is expected to induce an increase in real GDP.

Many empirical studies are based on this law. For instance, Adanu (2002), Cuaresma (2003), and Harris and Silverstone (2001) have analyzed the relationship between growth and unemployment within the framework of Okun's Law. Within this context, 'using more or less sophisticated versions of the Okun's Law relationship, many recent empirical papers have analyzed the stability of the Okun's Law coefficient' (Perman and Tavera, 2004). As Moosa (1997) stated, 'the majority of these studies examined its validity for the US economy.' For instance, using US data over the period 1950-1985, Evans (1989) found that 'the stochastic of GNP growth and the unemployment rate appear to be stationary, and there is substantial feedback between these variables.' This relationship has also been tested for Europe and other countries. Although the results generally support the empirical validity of the relationship, there is no consensus regarding the inverse relationship between GDP growth and the unemployment rate. Instead, the empirical findings related to such a relationship have been varied.

The differences in the empirical findings have been explained by Moosa (1997), who stated that differences in labour market rigidities may affect the observed relationship between GDP growth and the unemployment rates. In this respect, as Izyumov and Vahaly (2002) reported, it can be said that in countries with inflexible labour market and high unemployment rates, the relationship is relatively weak. In contrast, in countries where the labour market is highly flexible, there is an interaction between these variables. Further, as Kosfeld and Dreger (2004) emphasized, the unemployment benefit system also has to be considered. However, not all scholars agree with this analysis. For example, Gabrisch and Buscher (2006) argued that 'labour market rigidities do not play an important role in explaining high unemployment rates.'

The relationship between unemployment and productivity growth has also been studied. For instance, Muscatelli and Tirelli (2001) investigated the empirical relationship between unemployment and productivity growth for a number of OECD economies. Authors claimed that 'in most economies, there seems to be a negative correlation between unemployment and labour productivity growth.' Using panel data from 13 OECD countries from 1960 to 1990, Brauningner and Pannenberg (2002) claimed that 'if we allow for endogenous growth, unemployment reduces long-run productivity growth.' In their study, they found evidence that an increase in unemployment causes productivity to decrease in the long-run. The authors reported that there might be 'a potential trade-off between unemployment and productivity growth.' In addition, Schreiber (2005) stated that the notion that 'there exists a long-run connection between unemployment and productivity is controversial

among economists.’ It is obvious that in OECD countries, unemployment rates vary considerably due to economic and institutional factors.

Moreover, Aghion and Howitt (1994) analyzed the effects of GDP growth on long-run unemployment. In their paper, they asked the question of how the rate of GDP growth affects unemployment in the long-run. The authors focused on the ‘capitalization effect’, and they reported that ‘an increase in growth raises the capitalized returns from creating jobs and consequently reduces the equilibrium rate of unemployment.’ In his paper, Eriksson (1997) investigated ‘how unemployment and the long-run growth rate influence each other in steady state.’ A central finding is that ‘there is a trade-off between successful growth and unemployment.’ According to the author, not only does GDP growth affect unemployment, but labour market conditions affect growth as well.

In addition, Walterskirchen (1999) analyzed the macroeconomic links between GDP growth and the labour market in the EU. According to his empirical results, ‘there is still a strong and positive correlation between GDP growth and the change in employment.’ The author claimed that there is a negative correlation between unemployment and employment rates. Cerisier and Postel-Vinay (1998) investigated the long-run link between GDP growth and unemployment. They showed that ‘this link structurally depends on the relative importance of the degree of competition in the economy.’ Raurich and Sorolla (2004) also analyzed the relationship between GDP growth and employment in the long-run. The authors presented ‘an alternative explanation for a long-run positive effect of GDP growth on employment, which is based on real wage inertia.’ In their model, they presented that with wage inertia, a decline in the GDP growth rate reduces the employment rate permanently. Finally, Sorolla-i-Amat (2000) claimed that the relationship between GDP growth and unemployment is weak in the long-run, due to many exogenous variables.

From these studies, we can see that the relationship between GDP growth and unemployment is very complex. Theoretically, the link between the two is not at all clear. Muscatelli and Tirelli (2001) emphasized that the empirical evidence on this subject is very thin and has yielded mixed results. As the authors argued, ‘it is apparent that many factors are likely to influence the relationship between unemployment and growth.’ Labour market conditions and political and demographic factors affect the relationship between GDP growth and unemployment. In addition, the link between employment and unemployment is also unclear. As Walterskirchen (1999) mentioned, an increase in employment does not necessarily mean a reduction in unemployment by the same amount.

### **Labour Markets in MENA<sup>3</sup>**

In this section, some informative details about the labour markets in the countries studied in this paper will be given. Even if unemployment is measured differently in different countries, currently, one of the most important economic and social problems of the region is the high rate of unemployment. Egypt, Israel, Jordan, and Turkey all have high rates of unemployment. Furthermore, the MENA region had the lowest employment-to-population ratio, at 47.3 percent, in 2006. Additionally, labour force participation rates are very low in most countries in the region.

Examining labour trends by country, it is important to note that Egypt has experienced high rates of unemployment for the last two decades. In 1976, the unemployment rate was 4.8 percent; it then rose to 11.1 percent in 1986, and declined to 9.0 percent in 1996 (El-Mahdi, 2003). Such high unemployment rates continue for more recent years; in 2002, the unemployment rate was 9.9 percent, and in 2005, it was 11.7 percent. Today, this problem is at the top of the Egyptian political agenda. Further, there are also imbalances in the Egyptian labour market because labour supply exceeds labour demand. The dislocation between labour supply and demand is one of the major characteristics of the Egyptian labour market. This is a persistent problem, as the growth performance of the economy has failed to create sufficient jobs to absorb the rapidly growing labour force.

In Israel, one of the most important economic and social problems today is the high rate of unemployment, despite the fact that the Israeli labour force is one of the most highly skilled in the world. Despite a recent economic recovery, the unemployment rate remains at a high level. The official unemployment rate rose to 10.7 percent by the end of 2003, from 10.3 percent in 2002, and 9.4 percent in 2001. In 1996, it was 6.7 percent. As Hever (2006) mentioned, in 2004, the official unemployment rate declined to 10.4 percent. According to some estimates, however, the actual unemployment rate is higher than the official rate. Friedman and Suchoy (2004) claimed that the increase in unemployment is due to the business cycle and a huge immigration influx during the 1990s, as well as other structural changes. The main cause of high unemployment in Israel is immigration from Eastern European countries and the former Soviet Union to Israel after the breakdown of the Communist regimes.

Jordan has one of the highest unemployment rates in the MENA region. The high unemployment rate is the main characteristic of the Jordanian labour market. In Jordan, 'social and economic changes during the past three decades have caused wide fluctuations in demographic and labour market conditions' (Kanaan and Kardoosh, 2002). Because of these fluctuations, the labour force has grown at about four to five percent per year. As a result of this high growth rate, the unemployment rate is also high, at around 15 percent for the population as a whole, and 25 percent for women. It

can be said that the low economic participation rate is a result of the population structure (ETF, 2005).

Like many other developing and MENA countries, 'Turkey's labour market outcomes reflect the interaction of demographic and economic factors.... A rapid demographic transition has temporarily raised population growth' (World Bank, 2006). With the rapid expansion of the working-age population and the increase in the proportion of young people, unemployment has become one of the most pressing problems in the Turkish economy. As Auer and Popova (2003) mentioned, unemployment is largely a result of both demographic and economic factors. Within this context, 'the unemployment rate should follow the trends in the economy' (Berument, Dogan, and Tansel, 2006). For instance, in the aftermath of the 2001 economic crisis, unemployment reached unprecedented levels. It increased to 8.4 percent in 2001 and to 10.3 percent in 2002. The unemployment rate then remained at high levels in the following years. It was at 9.9 percent in 2006 and 2007. However, as Tansel and Tasci (2004) asserted, it is believed that the official rates understate the extent of the problem. Job creation is currently the most important issue in the Turkish economy, though this may be difficult to accomplish as the labour market is affected by both supply and demand issues.

## **Empirical Analysis**

In this section, we focus on the long-run relationship between unemployment and growth. We analyze the effect of GDP growth on unemployment. We would expect that high rates of GDP growth will lead to a reduction in unemployment. Within this context, we investigate the empirical relationship between unemployment and growth in Turkey and three MENA countries: Egypt, Israel and Jordan. These countries are MENA countries that have the necessary available data, consisting of annual GDP growth rates and unemployment rates within the period 1975 to 2005. All data were obtained from the ILO and World Bank and from statistical offices of the countries.

Before estimation, the data series were detrended. In order to detrend time series data, the most common approach in recent economic literature is to use Hodrick-Presscott Filter. The advantage of this filter is that it does not fit a linear trend, but it fits an optimal, smoothed and most likely non-linear trend. This gives the researcher the opportunity to clear the effects of long-run persistent shocks on trends.

While analyzing the impact of GDP growth on unemployment for country groups, we prefer to conduct cross-country comparison, which is a widely used method in the literature (e.g. Zellner, 1962; Moosa, 1997; and Harris and Silverstone, 2001). By

employing this method, we can search whether there any significant cross country differences for the sample.

Estimated model will be:

$$U_t = \alpha + \beta G_t + \epsilon_t \quad (1)$$

where, U is unemployment and G is GNP growth.

Table 1: Unit Root Tests Results

Variable	ADF (Level)	Lags	1st Difference	Lags
Growth – Turkey	-3,83***	6	-5,68***	2
26 Growth – Israel	-3,76***	3	-6,56***	1
Growth – Jordan	-3,16	5	-6,06***	2
Growth – Egypt	-3,46	0	-4,05***	0
Unemployment – Turkey	-2,66	1	-4,06***	6
Unemployment – Israel	-1,92	2	-3,82***	3
Unemployment – Jordan	-1,37	5	-3,33***	1
Unemployment - Egypt	-1,78	1	-4,19***	5

Superscript \*\*\* denote statistical significance at 1% level.

We have used the Augmented Dickey Fuller test (ADF test), in which the null hypothesis is non-stationarity. The results in Table 1 are based on the Hodrick-Presscott detrended data. For the ADF test, the null hypothesis is that the data are I(1), and the alternative hypothesis is that they are I(0). Results strongly imply that the series are stationary in the 1st difference. While deciding the number of lags, Akaike Information Criteria and Swartz Criteria have been used.

According to results presented in Table 2 for the four countries, GDP growth has a negative impact on unemployment. This relationship is stronger in Egypt and Turkey than in Israel and Jordan. The relationship between GDP growth and unemployment is weakest for Israel, but is still statistically significant.

These results may indicate that Turkey and Egypt are more successful in creating jobs while growing. In contrast, the results may also indicate that the source of Israel's growth mainly depends on productivity. R2 statistics shows that there are several other factors not examined here that have an impact on unemployment. The regression models assume that the error deviations are uncorrelated. In Table 2, Durbin-Watson statistics shows that there is no autocorrelation problem.

Table 2: Cross Country OLS Results

Variable	Turkey	Israel	Jordan	Egypt
	0,093	0,201	0,128	0,295
	-0,142	-0,062	-0,117	-0,185
t-stat	-2,088 (0,033)*	-2,112 (0,061)**	-2,469 (0,038)***	-2,889 (0,082)***
R <sup>2</sup>	0,191	0,186	0,213	0,175
DW	1,795	1,582	1,847	2,036
AIC	3,295	2,857	3,941	3,172
SC	3,388	2,931	4,003	3,263

Notes: AIC, Akaike's Information Criterion. DW is the Durbin–Watson test statistic, SC, Schwarz Criterion and Superscripts.

\*, \*\*, \*\*\* denote statistical significance at 10%, 5%, and 1% levels, respectively. Standard Errors in parentheses.

## Conclusion

The relationship between GDP growth and unemployment is very complex, and the results of the studies on this interaction are not clear. Although, on the empirical side, there is no consensus regarding the inverse relationship between GDP growth and unemployment rate, the literature has traditionally shown a negative relationship between these variables. In fact, studies of this relationship have produced interesting results, although the data generally support the empirical validity of the relationship. It must be said, however, that the relationship may not exist due to demographic factors and institutional conditions in the labour market.

In fact, one of the reasons for the high unemployment rates in the MENA region is the high population growth of these countries. The population growth rate remains very high, although the last few decades have witnessed its decline. Thus, high population growth rate is one of the reasons for the persistent high unemployment rates in the countries that analyzed in this paper. The four countries analyzed had an average population growth rate of 1.93 percent in 2006, compared to the OECD average of 0.6 percent.

We believe another reason for the high unemployment rates in the MENA region is the economic performance of the countries therein. In this regard, there is a common belief in a strong negative relationship between GDP growth and unemployment. It is believed that economies need GDP growth purely to create more jobs. Job creation is the most important issue in the MENA region, because the structure and level of unemployment is one of the most pressing current problems.

Moreover, in MENA countries, the labour markets are experiencing difficulties in both supply and demand. As it is known, labour demand is determined by economic conditions and policies. From this perspective, it can be said that, to create enough jobs, strong economic performance is necessary for the MENA countries.

In addition, our empirical results for Turkey, Israel, Jordan and Egypt support a negative relationship argument for GDP growth and unemployment. However, according to our results, the impact of GDP growth on unemployment is not strong. Cross-country analyses indicate that there are also factors other than GDP growth that affect unemployment. Nevertheless, it must be said that GDP growth is needed to create new jobs; however, such growth may not be sufficient in itself for a decrease in unemployment. Within this context, active labour market policies can be proposed. A large empirical literature shows that active labour market policies can help increase employment, and decrease unemployment. Additionally, structural reforms in labour markets are necessary but not sufficient, and these reforms are politically difficult to implement.

## NOTES

<sup>1</sup> The Middle East and North Africa (MENA) region comprises the subregions of the Middle East (Bahrain, Djibouti, Islamic Republic of Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Somalia, Syrian Arab Republic, United Arab Emirates, West Bank and Gaza Strip, Yemen) and North Africa (Algeria, Egypt, Libyan Arab Jamahiriya, Morocco, Sudan, Tunisia).

<sup>2</sup> Members of the Arab League only.

<sup>3</sup> This section is largely based on M. H Bilgin and I. N. Kilicarslan, 'An Analysis of the Unemployment in Selected MENA Countries and Turkey,' *Journal of Third World Studies*, Vol. XXV, No. 2, Fall 2008, pp.189-205.

## REFERENCES

- Adanu, K., (2002), 'A Cross-Province Comparison of Okun's Coefficient for Canada', Working Paper, EWP 0204, University of Victoria.
- Aghion, P. and Howitt, P., (1994), 'Growth and Unemployment', *The Review of Economic Studies*, 61(3): 477-494.
- Altig, D., Fitzgerald, T., and Rupert, P., (1997), 'Okun's Law Revisited: Should We Worry about Low Unemployment?', *Economic Commentary*.
- Auer, P. and Popova, N., (2003), 'Labour market policy for restructuring in Turkey: The need for more active policies', *Employment Paper*, 2003/51, International Labour Office, [www.ilo.org](http://www.ilo.org).
- Berument, H., Dogan, N., and Tansel, A., (2006), 'Economic Performance and Unemployment: Evidence from an Emerging Economy-Turkey', *International Journal of Manpower*, 27(7): 604-623.

- Bilgin, M. H. and Kilicarslan, I. N., (2008), 'An Analysis of the Unemployment in Selected MENA Countries and Turkey', *Journal of Third World Studies*, 25(2): 189-205.
- Brauninger, M. and Pannenberg, M., (2002), 'Unemployment and productivity growth: an empirical analysis within an augmented Solow model', *Economic Modelling*, 19(1): 105-120.
- Carmeci, G. and Mauro, L., (2003), 'Imperfect Labor Market and Convergence: Theory and Evidence for some OECD Countries', *Journal of Policy Modeling*, 25(8): 837-856.
- Carre, M. and Drouot, D., (2004), 'Pace versus type: the effect of economic growth on unemployment and wage patterns', *Review of Economic Dynamics*, 7: 737-757.
- Cerisier, F. and Postel-Vinay, F., (1998), 'Endogenous Growth and the Labor Market', *Annales D'Economie Et De Statistique*, No. 49/50.
- Christopoulos, D. K., (2004), 'The relationship between output and unemployment: Evidence from Greek regions', *Papers in Regional Science*, 83: 611-620.
- Cuaresma, J. C., (2003), 'Okun's Law Revisited', *Oxford Bulletin of Economics and Statistics*, 65: 439-451.
- Dickey, D. A. and Fuller, W. A., (1979), 'Distribution of the Estimators for Autoregressive Time Series with a Unit Root', *Journal of the American Statistical Association*, 74: 427-431.
- El-Mahdi, A., (2003), 'GPN Global Labor Market Database: Egypt', Global Policy Network, [www.globalpolicynetwork.org](http://www.globalpolicynetwork.org).
- Eriksson, C., (1997), 'Is There a Trade-Off Between Employment and Growth?', *Oxford Economic Papers*, New Series, 49(1): 77-88.
- ETF, (2005), *Unemployment in Jordan*, The European Training Foundation.
- Evans, G. W., (1989), 'Output and Unemployment Dynamics in the United States: 1950-1985', *Journal of Applied Econometrics*, 4(3): 213-237.
- Fanati, L. and Manfredi, P., (2003), 'Population, Unemployment and Economic Growth Cycles: A Further Explanatory Perspective', *Metroeconomica*, 54(2-3): 179-207.
- Friedman, A. and Suchoy, T., (2004), 'The NAIRU in Israel: An Unobserved Components Approach', *Israel Economic Review*, 2(2): 125-154.
- Gabrisch, H. and Buscher, H., (2006), 'The Relationship between Unemployment and Output in Post-communist Countries', *Post-Communist Economies*, 18(3).
- Harris, R. and Silverstone, B., (2001), 'Testing for asymmetry in Okun's law: A cross-country comparison', *Economics Bulletin*, 5(2): 1-13.
- Hetze, P., (2006), 'Skill Shortages, Labor Reallocation, and Growth', Working Paper, No. 59, Universitat Rostock, Thünen-Series of Applied Economic Theory.
- Hever, S., (2006), 'Unemployment in Israel's History and Today', Alternative Information Center (AIC).
- International Labour Organization (ILO) (2009), *Global Employment Trends - Update*, International Labour Office, Geneva, May 2009, [www.ilo.org](http://www.ilo.org)
- International Labour Organization (ILO) (2007), *Global Employment Trends, Brief*, International Labour Office, January 25, 2007, [www.ilo.org](http://www.ilo.org)
- Izyumov, A. and Vahaly, J., (2002), 'The Unemployment-Output Tradeoff in Transition Economies: Does Okun's Law Apply?', *Economics of Planning*, 35: 317-331.
- Kanaan, T. H. and Karoosh, M. A., (2002), 'Employment and the Labour Market in Jordan', European Commission and World Bank.
- Kosfeld, R. and Dreger, C., (2004), 'Thresholds for Employment and Unemployment. A Spatial Analysis of German Regional Labour Markets 1992-2000', *Discussion Papers in Economics*, No. 52/04, University of Kassel, Institute of Economics.
- Malley, J. and Molana, H., (2007), 'The Relationship between Output and Unemployment with Efficiency Wages', *German Economic Review*, 8: 561-577.

- Moosa, I. A., (1997), 'A Cross-Country Comparison of Okun's Coefficient', *Journal of Comparative Economics*, 24: 335-356.
- Muscattelli, V. A. and Tirelli, P., (2001), 'Unemployment and growth: some empirical evidence from structural time series models', *Applied Economics*, 33: 1083-1088.
- Nabli, M. K., (2004), 'Long Term Economic Development Challenges and Prospects for the Arab Countries', The Conference of the Institut du Monde Arabe, World Bank, February 12, Paris.
- Perman, R. and Tavera, C., (2004), 'Testing for convergence of the Okun's Law coefficient in Europe', *Discussion Papers in Economics*, No. 04-12, University of Strathclyde Department of Economics, Glasgow.
- Raphaeli, N., (2006), 'Unemployment in the Middle East-Causes and Consequences', *Inquiry and Analysis Series*, 265, The Middle East Media Research Institute, [www.memri.org](http://www.memri.org)
- Raurich, X. and Sorolla, V., (2004), 'Employment and Wage Formation in a Growth Model with Public Capital', *Default Paragraph Font*; [http://www.ub.es/ecopubBCN/ponencias/arch\\_pdf/raurich\\_sorolla.pdf](http://www.ub.es/ecopubBCN/ponencias/arch_pdf/raurich_sorolla.pdf)
- Schreiber, S., (2007), 'Shifts in the unemployment rate: the role of productivity growth', *Universitat Frankfurt Am Main*, [http://www.eea-esem.com/files/papers/EEA-ESEM/2007/2703/USCobreak\\_specialEsem2007.pdf](http://www.eea-esem.com/files/papers/EEA-ESEM/2007/2703/USCobreak_specialEsem2007.pdf)
- Sorolla-i-Amat, V., (2000), 'Growth, Unemployment and the Wage Setting Process', *W.P. UAB-IAE 458.00*, <http://pareto.uab.es/wp/2000/45800.pdf>
- Tansel, A. and Tasci, H. M., (2004), 'Determinants of Unemployment Duration for Men and Women in Turkey', *Discussion Paper, 2004/6*, Turkish Economic Association, [www.tek.org.tr](http://www.tek.org.tr)
- Yousef, T. M., (2004), 'Employment, Development and the Social Contract in the Middle East and North Africa', *World Bank*, [www.worldbank.org](http://www.worldbank.org).
- Walterskirchen, E., (1999), 'The Relationship between Growth, Employment and Unemployment in the EU', *European Economists for an Alternative Economic Policy (TSER Network)*, Workshop in Barcelona, 16 to 18 September 1999.
- World Bank, (2006), *Turkey: Labor Market Study*. (World Bank, April 14, 2006): Report No. 33254-TR, [www.worldbank.org](http://www.worldbank.org).