

Thesis of Doctoral (Ph.D.) Dissertation

**CHANGES IN EMPLOYMENT: A SECTORAL APPROACH WITH
SPECIAL FOCUS ON LABOR MARKET INSTITUTIONS.**

Domicián Máté

Supervisor: Dr. Péter Földvári



University of Debrecen

Doctoral School of Economics

Debrecen, 2012

Table of Contents

| | |
|--|----|
| 1. Background of the Dissertation..... | 3 |
| 2. Main Approaches. Goals and Structure of the Dissertation | 4 |
| 3. New Scientific Results and the Applied Methodology | 6 |
| 4. Further Research Directions..... | 13 |
| 5. References..... | 14 |
| 6. The Author’s Publications in the Subject Area of the Thesis | 16 |

1. Background of the Dissertation

Over the last two centuries the developed world has experienced steady and relatively stable economic growth, contributing to a constant improvement in standards. Empirical research has found that one-third of total income represents physical capital accumulation, the larger proportion, around two thirds, originates in earnings by workers [Mankiw–Romer–Weil, 1992]. The existence of labor economics is justified by the fact that, in industrialized countries, a large part of the population is made up of wage-earners or those aspiring to become employees.

More generally, labor economics covers a very large field of economics, and also sheds light on its most important problems. Its main areas of concern are varied, and include wages, (un)employment, the cost of labor, the numbers of hours worked per week, employees being fired and resigning, decisions by individuals to participate in the labor market, institutions such as unions, strikes etc. and many other subjects on which public debate frequently turns in modern society.

Labor market literature has evolved over the course of time. Since Adam Smith's *An Inquiry into the Nature and Causes of the Wealth of Nations* was published the theory has come through number of paradigm changes. Smith assumed that the level of wages makes it possible to equalize supply and demand for every kind of job. This led him to explain that wage differentials among jobs compensate for differences in the ability of workers and the difficulty of their tasks. This theory has left its mark on all subsequent thinking about wage setting and the functioning of the labor market. At the end of the 19th century a marginalist revolution laid the groundwork for modern economic theory. In the beginning, at least, the competitive models tended to conceal features that are specific to the labor market. Thus, the *Principles of Economics*, published by Alfred Marshall in 1890, retains “incoherences” found in Smith. In theory, wages equalize supply and demand for labor, but Marshall was driven by realism to recognize the role of market imperfections. Marshall pointed out in particular that the least skilled workers - those with low incomes and few savings - have to sell their labor quickly and they are at a disadvantage in wage bargaining. The crisis of 1929 threw fresh doubt on the representation of market models in terms of the immediate equilibrium of supply and demand. In the 1930s, many economists (*E. Chamberlin, J. Robinson, and J. R. Hicks*) were alert to developments in the analysis of imperfect competition. Labor economics emerged as an autonomous discipline in the 1940s, at the

hands of *J. Dunlop, C. Kerr, R. Lester* and *L. Reynolds*. Their primary descriptive approach was to take into account institutional specifics of the labor market in order to understand the level of employment and in general all elements that go to make up wage relationships. The first textbooks of labor economics were built on neoclassical inspiration and empirical formulas, which brought new methods and approaches to the theory. Since then labor economics has undergone the same evolution as many other fields. Economic theory has made strides in the analysis of informational asymmetries, dynamic behavior and the application of statistical techniques. In this way it has made advances, along with the calculating capacities of modern computers, which has led to a profound restructuring of labor economics in the last three decades of the 20th century. This discipline for the most part no longer concentrates on descriptive approaches. Today an article on labor economics is no different from one on micro- and macroeconomics or international economies.

The premise of this dissertation is based on an earlier empirical observation, that there is a changing macroeconomic relationship between unemployment and economic growth in the US [Knotek, 2007]. Although there are several other researches published on exploring the main reasons, this topic still holds great challenges.

2. Main Approaches. Goals and Structure of the Dissertation

Labor market imperfection has played a great role in macroeconomic research since the 1970s. Nowadays, i.e. the causes of unduly low employment, durable involuntary unemployment and recessions in business cycles are primary economic and also social problems. Thus, the interrelatedness of employment and economic growth has always been a focus of interest in the literature, which seems to have altered over recent decades [Csaba, 2006].

In this dissertation the changing macroeconomic environment via employment and economic growth are firstly examined by one of the most reliable empirical Okun's law [Okun, 1962]. We conclude that the link between rates of (un)employment and output growth obviously changed after the mid-1990s. Hence these results state the less power of economic policies to increase employment with economic growth than in the 1990s.

The following approaches are used to understand these changes:

- In our empirical research the time horizon is one of the key determinants. Traditionally in macroeconomics there are three dimensions. In the short run generally accepted that physical and human capital is certainly not fully

exploited because of price rigidity. However, in the long run both of them are fully utilized in the case of price adjustment. However, in the very long run other economic factors such as capital, technology or (labor market) institutions can also change.

- Thus, our research is not only related to macro- and labor economics, so the relation of employment and economic growth also should be revisited in the context of institutional economics. In this point of view, the institutions originate assumptions of economic growth.
- According to the theories we also distinguish¹ market economies and non-market oriented sectors. The main difference between them is that sectors of i.e. health, education, general administration and other services etc. are not profit oriented vis-à-vis the market branches.

The dissertation is structured by these approaches as follows: In section (I.), we first analyze the relevant macroeconomic tendencies from the early 1970s to the present and provide empirical results in economic growth, productivity and employment. In addition, over the period between 1980 and 2009, the so-called *Okun's* coefficients are estimated by a rolling regression method in OECD countries. In section (II.), we summarize the main theories, which deal with features of employment and economic growth in short, long and very long run. Besides the explanations of 'jobless' recoveries and growth phenomenon, other growth and institutional economic theories are also reviewed by the functions of labor and impacts of institutions.

In the empirical section (III.) we apply various statistical methods and basic econometric tests to identify i.e. unit-roots, cointegration and other characteristics of employment and output time series. We develop and employ a modified version of growth accounting method to further decompose components of GDP growth. Then we examine sectoral changes of employment and productivity in market and non-market oriented sectors. Finally, in this section, we choose an error-correction method (ECM) to identify the effects of various labor market institutions² on employment. Using also the same sectoral approach, we could demonstrate that unions, minimum wages and unemployment benefits have influenced employment in different ways.

¹ NACE-Clio classification of EC was used.

² Labor market institutions are a system of laws, norms, or conventions resulting from a collective choice and providing constraints or incentives that alter individual choices over labor [Boeri–van Ours, 2008].

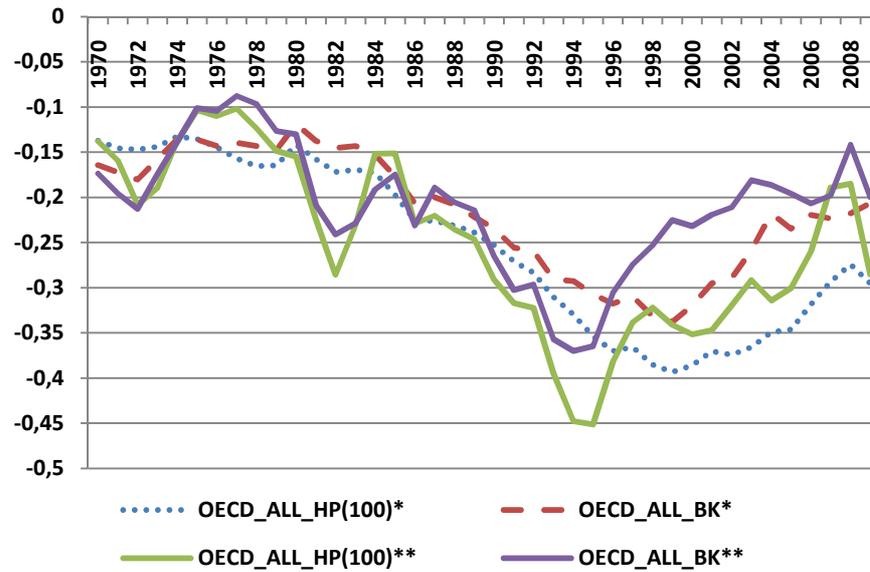
3. New Scientific Results and the Applied Methodology

First, as mentioned earlier, we examine relevant macroeconomic tendencies in employment and output. We test a hypothesis of the changing economic performance and the traditional Okunian postulate [Okun, 1962]. The mid 1980s is often identified as a special beginning period of what *McConnell* and *Perez-Quiroz* (2000), *Stummers* (2005) called the ‘Great Moderation’. The original term comes from the features of moderate economic volatility in the USA, where output and certain employment indicators suddenly and dramatically became less volatile. Traditionally Okun’s law was measured by variations between unemployment and real output over the business cycles, which was estimated originally for the US between 1948 and 1960. *Okun* suggested that a one-percentage point change in unemployment rates is associated with an approximately three percent change in output gaps in the opposite negative direction. This is regarded as a benchmark for policymakers to quantify the cost of increasing unemployment.

In addition, our results in comparison with an earlier empirical study by *Knotek* (2007) have been expanded for 23 OECD countries. Such an extended time period from 1980 to 2009 can hide the changing relationship between these economic factors. In order to capture this we use a rolling regression method, which enables us to estimate dynamics of the deviations from potential GDP per capita and (un)employment rates.

Figure (1) visualizes the rolling regression estimates for the different periods. Several conclusions can be drawn from this. Firstly, using two different univariate filters (Baxter-King and Hodrick-Prescott) methods to estimate the potential output per capita leads to comparable results. Secondly, the Okun’s coefficient was consistently negative (0.12–0.45) and varied considerably over time and business cycles. Thirdly, each set of the $[\beta]$ parameters experienced moderate fluctuations, but in particular around the mid-1990s. they suddenly increased in absolute terms. This suggests that the link between unemployment rates and output obviously changed. Finally, we could also examine how employment rates responded to the output growth and found that an increase in output gaps caused lesser changes in employment rates after the mid-1990s.

Figure (1): *Rolling regression estimates of Okun's coefficients, 1980-2009*



Source: own calculation based on AMECO Database.

Notes: (1) real GDP in constant prices. (2) using an * 11-year and a ** 6-year sample period. (3) the p-values of $[\beta]$ coefficients are under 0,01 in all periods.

Thesis I.: On the basis of our empirical results in several OECD countries, over the period between 1960 and 2009, deviations from potential GDP per capita caused smaller changes in the (un)employment rates than during the previous decades.

However, according to the structural break tests, *there is no statistical reason to believe that the ‘Great Moderation’ really existed.*

These interesting findings might reveal a serious dilemma for policymakers because nowadays, comparing to the 1990s, the macroeconomic environment does not seem to aid the acceleration of (un)employment rates through expansive fiscal and monetary policies. Although our results seem to suggest the increasing role of other economic factors as given technology, labor and political institutions etc., but further empirical researches are needed to prove this hypothesis.

In the second main part of this dissertation (II.) we summarize several theoretical concepts of a relationship between employment and output growth over the three time horizons. Hence, each of them is requiring different explanations. (1) Originally, jobless recoveries were understood as a phenomenon during the early stages of recoveries when employment grows slower than can be explained by the sluggish output growth alone. *Aaronson et al.* (2004) mainly emphasized the role of structural changes in this case.

Schreft et al. (2005) focused on the just-in-time employment practices after periods of long expansion or on uncertainties regarding the strength of the recovery. (2) In the long run, we adopted an assumption of *Rutkowski et al.* (2005) which emphasized certain market distortions. This might also be responsible for a less responsive employment to economic growth. From this point of view, the phenomenon of jobless growth can be affected by shifting employment in various sectors [Lilien, 1982] and loosening fiscal policy [Boeri–Garibaldi, 2004]. Besides these effects higher government expenditure leads to a classical crowding-out effect via increasing interest rates and also reduces demand for investments and labor. However, a loosening fiscal policy may be accelerated by public employment, which often crowds out private jobs by increasing wage pressure or generating more substitute products and services [Algan et al., 2002]. In the very long run (3), we rely on several concepts from Solow’s neoclassical model and new growth theories. In this approach employment and output have a positive relationship at an aggregate level, which was interpreted by the *Shumpeterian* creative destruction direct and indirect effects [Pissarides, 1990]. *Aghion and Howitt* (1992) claimed also in their model, that unemployment should decrease after a certain level of economic growth in very long run.

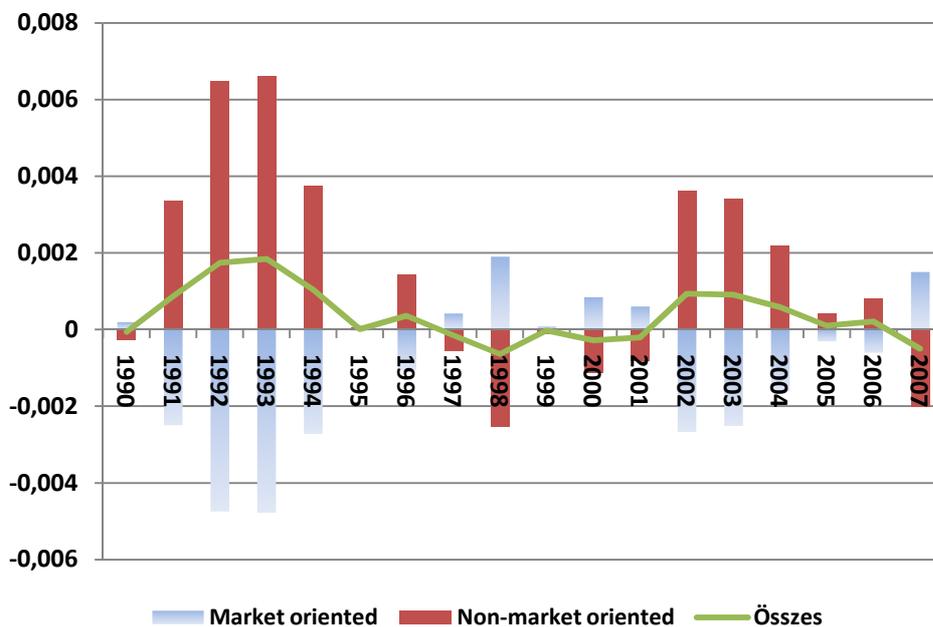
The third section of this dissertation contains our empirical research of employment and output growth relationship using different statistical methods in short and long run approaches. All in all, we confirmed (III.1.) the existence of unit roots in panel data for some OECD countries. This reveals that these processes have “long-memories”, so the effect of shocks in output and employment is likely to fade away only after a very-long period. The results from our growth accounting technique [Máté, 2010a] showed only a marginal effect of changes in the employment rates on economic growth, but i.e. changes in participation rates contributed to GDP growth with a similar magnitude as physical capital accumulation.

Following the main theories we focused on a closer observation of sectoral shifts in employment and productivity (III.2.). Although all over the world the size of service sectors has been expanded in terms of its share in employment, the role of employment shifts in recent decades decreased permanently. Our statistical approach establishes that the volume of employment increased faster than in OECD averages in non-market orientated (i.e. health, education and public services) sectors, but traditional descriptive labor statistics could not exactly determine the effect of structural changes.

Hence, a shift-share analysis was evaluated in analogy with *Peneder* (2002) to multiply productivity (GDP/employment) growth components. Our results from the last decades (1990-2008) regarding to the employment shifts confirmed the main findings of *Fagerberg* (2000), *Timmer* and *Szirmai* (2000), which also declared their marginal role. Unsurprisingly, the structure of employment can only slowly respond to changes in productivity. Thus, this method can be used to evaluate *Baumol's* hypothesis of a structural burden of labor reallocation. This approach predicts that employment shares shift away from progressive industries towards those with a lower growth of labor productivity (Baumol, 1967). Our research extended these empirical results into market and non-market oriented sectors, which claimed the increasing impacts of non-market branches in shifts of productivity growth after recessions (Figure 2.)

Thesis II.: In OECD countries between 1990 and 2007, the sectoral shifts of employment favored non-market oriented branches via productivity growth after recessions.

Figure (2): Structural burden of sectoral shifts in productivity growth (%), 1990-2007



Source: own calculation based on AMECO Database.

This phenomenon consists of employment shifts toward more productive non-market oriented sectors. In this case, these branches are less sensitive to fluctuations in business cycles as a result of greater labor security, which provided by a greater state attendance than market economies [*Algan et al.*, 2002].

Throughout this dissertation we argue that the institutional perspective is relevant since it extends the achievements and existing frontiers of macroeconomic and growth theories. Although these approaches stated that labor highly correlated with output in the long run, they also emphasized that institutions originated assumptions of growth.

Recently, serious debates have taken place in an attempt to explain the role of institutions and their interactions as they might influence the impacts of economic growth and employment. However, essentially no clear theoretical consensus has yet emerged and several unanswered problems remained [Boeri–Van Ours, 2008]. The perspective of endogenous growth theories [Barro–Sala-i-Martin, 1999] also claimed that the most important mechanisms by which labor market institutions can affect productivity growth operate mainly through physical and human capital accumulation and innovation. From this point of view, one interesting question is how institutions matter, and also what kind of characteristics they should have in economies.

In section (III.3.) we followed the earlier sectoral approach to identify the main features and impacts of institutions to employment in our estimations. All in all, in our hypothesis labor market institutions are existed in employment and economic growth relationship. In order to demonstrate short and long run economic processes we use an error-correction method (ECM) to analyze how certain institutions and their interactions determine employment growth in different branches.

$$\Delta y_{it} = \beta_0 - \beta_1 y_{it-1} + \beta_2 \Delta x_{it} + \beta_3 x_{it-1} + \beta_4 \Delta w_{it} + \beta_5 w_{it-1} + \beta_6 \Delta U_{it} + \beta_7 U_{it-1} + \varepsilon_{it} \quad (1)$$

where (x): denotes the log of real GDP, (y): the number of employees and (w): real wages in logarithm; thus U demonstrates the institutions in period (t) and OECD countries (i), Δ are differences and ε is the residual.

Using this model specification [Equation (1)] we establish the impacts of some labor market institutions and stated that unions, minimum wages and unemployment benefits effected employment both in short and long run. Though, as we suspected, each of them played a different role in market and non-market oriented sectors.

Thesis III.: An increase in union density decreased employment growth in both market and non-market oriented sectors of the examined OECD countries, 1970-2007. Thus, employment was strongly reduced by the unions in non-market oriented branches than in market economies.

Labor (or trade) unions are voluntary membership organizations that represent the interests of their members. Increasingly at the beginning of the twentieth century they became national organizations aiming to include all workers and to have a greater political role. Because of workers' interests unions are not only interested in wages but also the number of employees. There are two avenues of research in the empirical literature on the effects of unions to the labor market. Some research estimated the effects of unions on members' wages vis-à-vis non-members, while others dealt with union density and bargaining coordination on employment and inflation. *Ebbinghaus* and *Wisser* also reported that the 'de-unionization' was concentrated mostly in Anglo-Saxon countries (USA, Canada and United Kingdom etc.), where union density in non-market oriented sectors were five times higher than in market economies. These facts confirm that an increase in union density reduces employment greater in these sectors.

Using a similar ECM we explored the impacts of minimum wages on employment. The minimum wage is a labor market institution that sets a wage floor, that is, a lower limit to the wage paid to individual workers. Since *Stigler* (1947) there have been various empirical studies to analyze the main features of minimum wages. Their effects depend on characteristics of the labor market. The model of the perfectly competitive market models highlighted the negative aspects of the minimum wage for employment. However, other theoretical frameworks, such as the matching model with endogenous labor market participation or the job-search effort shed light on situations in which a rise in the minimum wage leads to an increase in hiring. In particular, only two thirds of the studies, reviewed by *Neumark and Wascher* (2007), found negative employment effects of minimum wages, and these effects were not always statistically significant. Despite various empirical differences in minimum wages across countries we still attempted to measure their impacts on employment. As in many studies, we also used the *Kaitz-index* [Kaitz, 1970] to capture the enforcement of minimum wages at the average sectoral levels. Our estimations confirms those of *Dolado et al*, (1996) that minimum wages have a marginal affect on employment, but this was realized only in market oriented branches.

Thesis IV.: In OECD countries *the minimum wage had no significant effect on employment growth in non-market oriented sectors, 1985-2007.*

The rise in (Kaitz index of) minimum wages increased employment in market economies.

According to Cahuc and Zylberberg (2010: pp. 720-721) the following reasons explain the possible existence of this positive relationship between the minimum wage and employment. In the first place, they stated that this could occur principally where labor mobility is restricted and the numbers of firms are low. Secondly, the minimum wage acts positively on employment only when it lies below the aggregate competitive wage. Finally, high wage-elasticity of labor supply impact positively on employment.

Unemployment benefits (UBs) protect against uninsurable labor market risks and offer replacement income to workers experiencing unemployment after having lost their jobs. Nowadays all OECD countries have an unemployment benefit system in place. However, in each of them strict legislation and norms operate. In the labor market UBs affect outcomes via three channels: (1) they increase the reservation wage of recipients because they make workers “choosier” when deciding upon available jobs. (2) They also improve the fallback option of workers and increase wage claims at bargaining. (3) Finally, they induce more people to participate in the labor market insofar as they increase the value of employment over inactivity. So, in our estimates we tested the ratio of UBs divided by GDP per capita in different market and non-market oriented sectors to confirm whether they increase or decrease employment.

Thesis V.: An increase in unemployment benefits (UBs) in examined OECD countries, between 1970 and 2007, reduced employment both in market and non-market economies.

Furthermore, the negative impact of UBs was greater than in non-market oriented sectors in long run.

Labor market institutions never operate in isolation. Hence, their employment effects usually interact with other institutions, so we needed to examine all of them. In our empirical results significant cross-interactions were found in the case of unions and minimum wages, in addition with unions and UBs. From this point of view, an increase in union density with minimum wages and also union density with UBs caused less employment growth in both sectors than separately.

4. Further Research Directions

Several additional research directions have emerged in this thesis. In terms of different time periods, the first potential could focus on the expanding business cycle periods to explore short run relation of employment and output. Regarding the more serious economic crises, it is worth comparing the common features of these periods.

In long run, the sectoral approaches might be expanded by introducing a human capital dimension. The hypothesis of this perspective is the following: those industries which employ low or medium-low qualified employees suffer from a structural burden from sectoral shifts of employment. Thus, another research could be focused on technology according to e.g. *O'Mahoney-Van Ark's* (2003) classification. Hopefully, structural bonus will be typical in high productivity industries. Moreover, the role of ICT should be examined in the knowledge-intensive service sectors, which were the main 'engine' of expanding economies after the last (2008-2009) recession [Csizmadia et al. 2009].

Although our empirical findings could demonstrate the impacts of some labor market institutions in different sectors, but in our model each of them, i.e. Active Labor Market Policies (ALMP) and also employment legislations (EPL) were not significant. Though, future researches in other approaches and methods could be fruitful.

5. References

- AARONSON, D. – RISSMAN, E. – SULLIVAN, D. [2004]: *Assessing the Jobless Recovery*, in Economic Perspectives, Federal Reserve Bank (FRB) of Chicago, Vol. 28. No. 2.
- AGHION, P. – HOWITT, P. [1992]: *A Model of Growth Through Creative Destruction*. *Econometrica*, Vol. 60. No. 2. pp. 323–351.
- ALGAN, Y. – CAHUC, P. – ZYLBERBERG, A. [2002]: *Public Employment and Labor Market Performances*, Economic Policy, pp. 1–65.
- BARRO, R. J. – SALA-i-MARTIN, X. [1992]: *Convergence*, *Journal of Political Economy*, Vol. 100., No. 2. pp. 223–251.
- BAUMOL, W. J. [1967]: *Macroeconomics of Unbalanced Growth: The Anatomy of Urban Crisis*. *The American Economic Review*, Vol. 57. pp. 415–426.
- BOERI, T. – GARIBALDI, P. [2004]: *Labor Market Performance in Transition Economies: A Macroeconomic Perspective*, Background Paper for *Enhancing Job Opportunities: Eastern Europe and the Former Soviet Union*, World Bank, Washington, DC.
- BOERI, T. – van OURS, J. [2008]: *The Economics of Imperfect Labor Markets*, Princeton University Press. New Jersey.
- CAHUC, P. – ZYLBERBERG, A. [2010]: *Labor Economics*, Cambridge MIT Press, London.
- CSABA, L. [2006]: *Quo vadis Európa? Gazdasági növekedés, egyensúly, foglalkoztatás az Európai Unióban*, Magyar Tudomány, 2006/9.
- CSIZMADIA, P. – ILLÉSY, M. – ICHIRO, I. – SZANYI, M. [2009]: *Organizational Innovation in the Manufacturing Sector and the Knowledge Intensive Business Services*. In: Kotsis Ágnes – Polónyi István (eds.) *Competitio könyvek*, 10. Kiadás.
- DOLADO, J. – KRAMARZ, F. – MACHIN, S. – MANNING, A. – MARGOLIS, D. – TEULINGS, C. [1996]: *The Economic Impact of Minimum Wages in Europe*, *Economic Policy*, October. pp. 319–372.
- EBBINGHAUS, B. – VISSER, J. [2000]: *Trade Unions in Western Europe since 1945*. London, UK, Palgrave-Macmillan.
- FAGERBERG, J. [2000]: *Technological Progress, Structural Change and Productivity Growth: a Comparative Study*. *Structural Change and Economic Dynamics*, Vol. 4. pp. 393–412.
- GORDON, R. J. [1984]: *Unemployment and Potential Output in the 1980s*. *Brookings Papers on Economic Activity*, Vol. 15. pp. 537–564.
- HSING, Y. [1991]: *Unemployment and the GNP Gap: Okun's Law Revisited*, *Eastern Economic Journal*, Vol. 17. pp. 409–416.
- KAITZ, H. [1970]: *Experience of the Past: The National Minimum in Youth Unemployment and Minimum Wages*, Bureau of Labor Statistics, Bulletin 1657, pp. 30–54.
- KAUFMAN, R. [1988]: *International Comparison of Okun's Law*, *Journal of Comparative Economics* Vol. 12. pp. 189–203.
- KNOTEK, E. S. [2007]: *How Useful is Okun's Law*, *Economic Review*, FRB of Kansas City, pp. 73–103.
- LANDES, D. S. [2006]: *Why Europe and the West? Why Not China?*, *Journal of Economic Perspectives*, Vol. 20. No. 2. pp. 3–22.
- LEE, J. [2000]: *The Robustness of Okun's Law: Evidence from OECD Countries*. *Journal of Macroeconomics*, Vol. 22. No. 2. pp. 331–356.
- LILIEN, D. [1982]: *Sectoral Shifts and Cyclical Unemployment*, *Journal of Political Economy*. Vol. 90. pp. 777–794.

- MANKIW, G. N. – ROMER, P. M. – WEIL, D. N. [1992]: *A Contribution of an Economic Growth*, The Quarterly Journal of Economics, Vol. 107. No. 2. pp. 407–437
- MARSHALL, A. [1890]: *Principles of Economics*, London: Macmillan and Co., Ltd.
- McCONNELL, M. M. – PEREZ-QUIROZ, G. [2000]: *Output Fluctuations in the United States: What Has Changed in the Early 1980s?*, American Economic Review, Vol. 90. No. 5. pp. 1464–1476.
- MOOSA, J. I. [1997]: *A Cross-Country Comparison of Okun's Coefficient*, Journal of Comparative Economics Vol. 24. Issue 3. pp. 335–356.
- MOURRE, G. [2006]: *Did the pattern of aggregate employment growth change in the euro area in recent years?*, Applied Economics, Vol. 38. No. 15. pp. 1783–1807.
- NEUMARK, D. – WASCHER, W. [2007]: *Minimum Wages and Employment*, IZA Discussion Paper No. 2570.
- OKUN, A. M. [1962]: *Potential GNP: Its Measurement and Significance*. American Statistical Association. Proceedings of the Business and Economics Statistics Section. pp. 98–104.
- O'MAHONEY, M. – van ARK, B. [2003]: *EU Productivity and Competitiveness: An industry perspective. Can Europe Resume the Catching-up Process?*, European Communities, Luxembourg.
- PENEDER, M. [2002]: *Structural Change and Aggregate Growth*, WIFO Working Papers, No. 182. Vienna.
- PISSARIDES, C. A. [1990]: *Equilibrium Unemployment Theory*, Oxford: Basil Blackwell.
- PRACHOWNY, M. F. J. [1993]: *Okun's Law: Theoretical Foundations and Revised Estimates*, The Review of Economics and Statistics, Vol. 75. No. 2. pp. 331–336.
- RUTKOWSKI, J. J. – SCARPETTA, S. – BANERJI, A. – O'KEEFE, A. – PIERRE, G. – VODOPIVEC, M. [2005]: *Job Opportunities, Eastern Europe and the Former Soviet Union*, World Bank, Washington DC.
- SCHREFT, S. L. – SINGH, A. – HODGSON, A. [2005]: *Jobless Recoveries and a 'Wait-and-See' Hypothesis*, Economic Review, 2nd Quarter, FRB of Kansas City. pp. 81–99.
- STIGLER, G. [1946]: *Economics of Minimum Wage Legislation*, American Economic Review, Vol. 36. pp. 535–543.
- SUMMERS, P. M. [2005]: *What Caused the Great Moderation: Some Cross Country Evidence*, Federal Reserve Bank of Kansas City. Quarterly Review. No. 3. pp. 5–32.
- TIMMER, M. P. – SZIRMAI, A. [2000]: *Productivity Growth in Asian Manufacturing: the Structural Bonus Hypothesis Examined*. Structural Change and Economic Dynamics, Vol. 4. pp. 371–392.

6. The Author's Publications in the Subject Area of the Thesis

Journal Articles in English

MÁTÉ, D. [2010]: *Estimating Labor Market Performance in Twenty-Three OECD Countries, 1980-2009*, Romanian Economic Journal, Vol. 13. No. 38, pp. 213–232.

<http://rejournal.eu/No38/tabid/214/Default.aspx>

MÁTÉ, D. [2010]: *A Theoretical and Growth Accounting Approach of Jobless Growth*, Periodica Oeconomica, Vol. I. pp. 65–76.

<http://gti.ektf.hu/po.html>

Journal Articles in Hungarian

MÁTÉ, D. [2011]: *A munkaerő-piaci intézmények hatásai a foglalkoztatásra szektorális megközelítésben*, Competitio, X. évfolyam, 2. szám, 27–42. o

MÁTÉ, D. [2010]: *A kibocsátás és a munkanélküliség kapcsolata az okuni posztulátum szemszögéből*, Statisztikai Szemle 2010/10-11. szám, 1106–1122. o.

http://www.ksh.hu/statszemle_archive/tartalom2010.html

MÁTÉ, D. [2009]: *A foglalkoztatás és termelékenység permanens szektorális változásai*, Competitio, VIII. évfolyam, 1. szám, június, 117–137. o.

<http://www.econ.unideb.hu/competitio-viii-efolyam-1-szam-2009-junius-138.html>

MÁTÉ, D. [2007]: *„Tudás-alapú” munkapiaci sajátosságok az észak-magyarországi régióban*, Acta Oeconomica Nova Series XXXIV, 88–105 o.

Other Publications

MÁTÉ, D. [2009]: *A theoretical approach of jobless growth*, V. Erdei Ferenc Konferencia, Kecskeméti Kertészeti Főiskola, V. Erdei Ferenc Konferenciakötet.

MÁTÉ, D. [2009]: *Munkapiaci tükrök 2008*, Competitio, VIII. évfolyam, 1. szám, 2009. június,

MÁTÉ, D. [2009]: *A munkapiaci kirekesztettség és a gazdasági növekedés összefüggései*, Tavasz Szél Konferencia, Szeged, Tavasz Szél 2009, Konferencia kiadvány, DOSZ,

MÁTÉ, D. [2008]: *Rugalmasság és biztonság: egy lehetséges megoldás a munkaerő-piacon*, A „Globalizáció – Európai Unió – Magyarország” c. Nemzetközi Konferencia, Eger, Globalizáció–Európai Unió–Magyarország Konferenciakötet,

MÁTÉ, D. [2007]: *A "munkahelytelen" növekedés kérdései az EU-ban*, IV. Erdei Ferenc Konferencia, Kecskeméti Kertészeti Főiskola, IV. Erdei Ferenc Konferencia, Konferenciakötet I.,

MÁTÉ, D. [2007]: *A gazdaság és a humán erőforrások fejlődésének néhány aspektusa*, II. Pannon Gazdaságtudományi Konferencia, Veszprémi Egyetem, Európai integráció - elvek és döntések Gazdaságfejlődés Európában Konferenciakötet II.,

MÁTÉ, D. [2007]: *Gazdasági ismeretek: válogatott fejezetek mikro- és makroökonómiából*, Főiskolai jegyzet, EKF Kiadó, pp. 160,

Notes: