# A Theoretical and Growth Accounting Approach of Jobless Growth

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n the mid 1980s during the "Great Moderation" major economic variables such as GDP, monthly payroll employment and the unemployment rate etc. began to decline their volatility. This study focuses on the so-called jobless growth phenomenon, in the long run. In this paper it is also emphasised that the main theoretical explanations of this process are labour market imperfections, i.e. the sectoral-shifts and crowding-out effects, the loosening fiscal policy and wage pressure of public employment. Finally, components of economic growth in previous decades are estimated with a simple growth accounting method and the effects of activity, employment, participation and unemployment rates are also taken into account. Analysing the data on OECD countries, this paper concludes that the link between labour and output has changed. *JEL Classification: J64, J24, O49.* 

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## 1. Introduction

During the last two centuries the developed world experienced steady and relatively stable economic growth, contributing to a constant improvement in living standards. Unemployment got into a primary focus of macroeconomics in the early 20<sup>th</sup> century, partly as a result of the Great Depression, and again came to the forefront of research in the 1970s when the economic boom of the 1950s and 60s were replaced by stagflation. The year 1984 identified as an important year in macroeconomics, as a start of what some economists called the "Great Moderation" (*Summers*, [2005]). The term comes from the features of U.S. economic activity, which suddenly and dramatically became less volatile and this also has persisted in other OECD countries to this day. In the mid 1980s the major economic variables such as GDP, the unemployment rate, the monthly payroll employment etc. began to decline their volatility (Figure 1.).

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Thanks to the low volatility and periods of "secure" economy, mainly households and companies were seen to advance a more stable employment environment. Serious debates have been occurred to explain this phenomenon. Essentially there is no consensus but generally three main types of theories have been suggested for this change, i.e. improved *macroeconomic policies*, the *structural changes* and only a "good luck" (McConnell–Perez-Quiroz, [2000]), (Stock–Watson, [2002]).



Source: *own calculation based on data from GGDC and AMECO Databases.* Notes: we used the logarithm of GDP in 2000 constant prices and the method of Exponential Moving Average (EMA)

Figure 1. Changes in economic growth (left axis) and unemployment rate, 1960-2008

One important common focus of these macroeconomic theories whether there is a policy that could achieve long-term sustainable economic growth, while also create jobs or decrease unemployment. Unfortunately, recent findings of the mainstream business cycles theories are still unclear in practice, and some questions also remain for decision makers (*Mankiw*, [1999]). Hence the author accepts the fundamental assumption of the neo-Keynesian economics school, which emphasised that the neoclassical market-clearing models could not give unambiguous and complete explanation for business cycles and changes in employment. Though, the other relevant theories and models of Real Business

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Cycle (RBC) School have proven sometimes quite accurate in reproducing cycles (*Kydland–Prescott* [1982]).

The starting point of this study is that the labour market imperfections might be responsible for low employment and long-term unemployment. Although the relationship between economic growth and job creation seems to have loosened during last decades, this cannot be considered as a new phenomenon. The U.S. economy's activity has been examined by the institute of the National Bureau of Economic Research (NBER) and in the 1970s it was found that during recoveries, right after recessions, *unemployment decreased a lesser extent than* one would expect based on *the growth of output*. This phenomenon was determinate by economist as *jobless growth*.

This obviously contradicts the traditional *Okunian* postulate about the negative relation between output and unemployment (*Okun* [1962]). Okun's law has been checked empirically many times, and this negative correlation still seems to exist. This is also confirmed by *Knotek* [2007], who estimates the coefficient between growth of output and unemployment through several decades and finds that the current unemployment rates (from the middle 1980s on) respond less to the changes of output than they did (from the 1960s until 80s). These findings can be reconciled if we assume that the correspondence between these two factors have been changing over time.

Thus, the primary aim of this paper is to contribute to better understand the jobless growth phenomenon in the long run. In recent decades, apart from the fluctuations, employment, as well as unemployment and labour activity were seemed to less responsive to economic growth. The paper is organized as follows. In section 2, we provide the relevant theoretical framework of jobless growth - labour market imperfections such as distorted government policies and other institutional interactions being core elements of these explanations. In Section 3, we develop a simple growth accounting method to factorize the components of output growth based on this concept.

#### 2. Theoretical approaches of jobless growth in the long run

The theme of jobless growth is not a purely macroeconomic problem, so it should be examined from an institutional perspective as well. Nevertheless, according to the traditional neo-Keynesian perception, the different types of market failures are essential to understand labour market imperfections. Hence, economic fluctuations do not reflect Pareto-efficient solutions in the choices of consumers and technology changes, but these could be much easier explained by market failure phenomena (*Mankiw* [1990]). Following this assumption, the labour market imperfections may be responsible for jobless growth, as well as the operation of market barriers might affect the long-term economic relationship between economic growth and employment. There are several

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assumptions which emphasize the role of the state in labour market imperfections. These are partly based on the traditional *Hayekian* coercion perspective (*Hayek*, [1960]), wherein the general aim of the state is to survive permanently. This interest manifests itself in the maintenance of bureaucracy, which was consequently reflected by an increasing share of public employment. Some theories of jobless growth are based on role of state distortions. So what are these relevant approaches?

The phenomenon of jobless growth can be caused by loosening fiscal policy in several ways (*Boeri–Garibaldi* [2004]). First, higher government expenditure leads to the classic crowding-out effect via increasing real interest. The high interest rates will reduce the demand for private investments, also causing less demand for labour. In addition, fiscal policy changes alter the expectations of individuals and their perception of the government's credibility. However, in the future, a loosening of fiscal policy might increase the tax burden. In other words firms perceive this as an ominous sign to reduce their future investments and employment.

The second crowding-out channel has effect on public employment. Naturally, the main objectives of public and private employment are very different. Whereas private employment is aimed to maximize firms' profits, the objectives of public employment are similar to the politicians (*Borland–Gregory* [1999]). Following this explanation, only public employment could provide certain public goods (i.e. the court of judicature, public safety etc.), or institutions that private sector cannot afford (unemployment benefits, health care and public education systems etc.). Public employment is often considered to crowd out private jobs by increasing wage pressures and by competing for products which could substitute those produced by the private sector. All in all, the impact of public on private jobs depends on three key features:

(1) The degree of substitutability between the production of the public and private sector. Obviously, the public goods created in sectors i.e. police, justice, army etc. are not substitutable by private production and *cause smaller crowding out effect* on private jobs than transportation, education and health care, where private activities can play an important role (*Algan et al.* [2002]).

(2) The creation of public jobs may improve the expected gains of unemployed workers and also the size of the rents received by employees, which increase wage pressure and decrease private employment (*Holmlund* [1997]). In other words the higher wages, fringe benefits, job security and lower effort than in the private sector is likely to attract many individuals into the public sector, and to crowd out many private jobs. 'Bad' public jobs with low wages, high insecurity and hard working conditions, on the other hand, are not likely to attract many workers. Nevertheless the disproportionate increase in real wages in public sector deteriorates the fiscal balance even more.

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(3) The cost of public jobs generally implies an increase of public expenditure. It could reduce the profitability of firms after taxation and also future investments. In both cases, the direct effect is negative on the demand and productivity of the private sector (*Boeri–Garibaldi* [2006]).

The empirical literature confirms unambiguous impact of public employment on labour market performance. Algan et al. [2002] estimate that the creation of one public job in some OECD countries destroys about 1.5 jobs and adds 0.3 unemployed. Moreover the crowding out effect of public jobs does not seem to be a matter of size. It heavily depends on the features of public jobs created, degree of substitutability with private production, and the size of rents in the public sector (differences in wages, working conditions, and the extent of misuse) etc. *Boeri et al.*, [2000] examine the correlation between non-agricultural and public employment rates, and estimate that one public job crowds out approximately 0.3 private jobs.

Thus, the literature is quite divided about the role of structural-shift effects in jobless growth. Some of them are fairly sceptical (Abraham-Katz [1984]), while others like Sakata [2002] finds evidence that short-term shifts of employment in certain sectors affect economic growth. Indeed, Groshen and Potter [2003] emphasize that after various major economic crises, during recovery, structural effects play increasingly greater role in economic changes. Others, like Loo [1998] test the relevance of different monetary and fiscal variables to explain changes in unemployment in the long-run. Onaran [2008] mainly focuses on the new Central and Eastern European EU-member countries and especially the changes in manufacturing sectors using static and dynamic panel regression models. He concludes that in a number of countries and industrial sectors the employment and wage changes are less responsive to the effects of economic growth. Others (Li et al. [2007]) examined the effects of the so-called Schumpeterian creative destruction in the Irish manufacturing sectors. In this concept the role of industry is to generate the maximum possible output and wealth in highly productive enterprises, while the main employment benefits are generated and captured outside the manufacturing entities.

The author's earlier research (*Máté*, [2008]) dealt with the effects of sectoral shifts in the sense of productivity and employment changes. According to the results there are significant structural employment shifts in certain sectors, but these changes play a decreasing role in some OECD countries<sup>32</sup>. In other words, the structure of employment adapts very slowly to changes in productivity. Furthermore, this study was pointed out that the *structural losses* hypothesis of

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<sup>&</sup>lt;sup>32</sup> These findings are essentially consistent with the results of Timer and Szirmai [2000], and Fagerberg [2000].

Baumol  $(Baumol [1967])^{33}$  was mainly significant in branches dominated by less-qualified workforce. Hence, these factors could affect aggregate productivity negatively, but these sectors cannot quickly adapt to structural changes.

Some theoretical approaches emphasize the indirect effects of labour market institutions and their interactions, which might influence the impact of economic growth on employment. The question is only how institutions matter. Labour 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 labour (*Boeri–van Ours* [2008]). The perspective of endogenous growth theories (*Barro–Sala-i-Martin* [1999]) points out that the most important mechanisms by which labour market institutions may affect productivity growth are mainly through physical and human capital accumulation and technological innovations. In addition *Layard and Nickel* [1999] conclude that under certain conditions trade unions, and other institutions systems have a plausible impact on equilibrium unemployment and on long-term productivity as well.

#### 3. Economic growth accounting approach in OECD countries

As a result of physical or human capital accumulation, or simply technological changes, the GDP would apparently grow in the long run. Because of this we have to examine and factorize the components of GDP growth with a growth accounting method. The results reflect that economic growth cannot be only explained by an increase of capital stock, and changes of population or labour force rates. It is expected that either the process of technological development or the different interactions of labour market institutions could play a key role in economic growth.

Let us choose a simple neoclassical aggregate production function:

$$Y_t = A_t K_t^{\alpha} L_t^{1-\alpha} \tag{1}$$

where [Y] is the GDP, [K] and [L] are physical and labour capital in the period [t], and [A] naturally represents a 'catch all' factor for technology, role of institutions and other relevant forces which measures how productively capital and labour are used in production. Thus, assume a constant return to scale.

Denote the active to total population rate by  $[a_t] = N_t/P_t$  where [N] and [P] are the active and total population. Similarly define the employment ratio<sup>34</sup>  $[e_t] =$ 

<sup>&</sup>lt;sup>33</sup> According to the *Baumol's* theoretical structural changes hypothesis of productivity the employee are directed from the mainly progressive industrial branches to the weaker productivity service sectors, hence the aggregated productivity could decrease.

<sup>&</sup>lt;sup>34</sup> Definition of OECD and EUROSTAT.

 $L_t/N_t$ . These allow us to express labour as follows:  $[L_t] = e_t * N_t = e_t * a_t * P_t$ . Hence, the production function yields:

$$Y_{t} = A_{t}K_{t}^{\alpha}L_{t}^{1-\alpha} = A_{t}K_{t}^{\alpha}(e_{t}a_{t}P_{t})^{1-\alpha}$$
(2)

Taking both sides of equation their logarithm leads to the following loglinear form:

$$\ln Y_{t} = \ln A_{t} + \alpha \ln K_{t} + (1 - \alpha) \ln e_{t} + (1 - \alpha) \ln a_{t} + (1 - \alpha) \ln P_{t}$$
(3)

Introduce unemployment to the equation as follows. Let us denote the unemployment rate as [u] where  $[u_t] = U_t/LF_t$ . Thus, the labour force [LF] equals to the sum of labour [L] and unemployed [U], so  $[LF_t] = U_t+L_t$ . Hence  $[L_t] = [LF_t]-u_t*[LF_t] = [LF_t]*(1-u_t)$ . We also know that the economic activity (participation) rate [p] is estimated as  $[p_t] = LF_t/N_t$ . Hence the equation of labour can be substituted as  $[L_t] = p_t*a_t*P_t*(1-u_t)$ .

Since the rate of unemployment is generally not very high (8.6 percent in OECD average), use the approximation that  $[\ln(1-u_t)] \approx -u_t$ . Hence, replace the labour by the active to total population rate, the economic activity and unemployment rate as the previous (3) equation.

$$\ln Y_{t} = \ln A_{t} + \alpha \ln K_{t} + (1 - \alpha) \ln p_{t} + (1 - \alpha) \ln a_{t} + (1 - \alpha) \ln P_{t} - (1 - \alpha) u_{t}$$
(4)

The differentiation of equations (3) and (4) with respect to time express the growth rate of GDP as a function of the growth rate of its *components* (physical capital, activity, employment and unemployment rates). The residual, that is the part not explained by these factors, is labelled the Total Factor Productivity or TFP, denoted by A.

Using the time series (1980-2004) of some OECD countries from Groningen University's Growth Accounting Database [GGDC] and European Commission's Annual Macroeconomic Database [AMECO], the accounting results are reported in Table 1. The results are in accordance with the expectations; economic growth after the millennium reduced, the effects of physical capital have been steady at 0.6 and 0.9 per annum. Thus physical capital could have a continually greater weight in equations. Meanwhile the role of the unemployment rate, with the exception of the period 1980-90, had a marginal effect.

Changes in the employment rate or equivalently that of the participation rate contributed to economic growth with a magnitude similar to that of physical capital accumulation. The sign is however not always positive (or negative) in case of the unemployment rate, which resulted in quite significant slowdown of economic growth. Hence, some labour components, according to the theory, played a key and lesser role in economic growth besides the technological shocks (TFP).

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Average years	ΔΥ/Υ	ΔΑ/Α	α·ΔΚ /Κ	(1-α) Δa/a	(1-α) Δe/e	(1-α) Δp/p	-(1-α) Δu	(1-α) ΔΡ/Ρ	(1-α)
1980-1990	2,61	1,17	0,72	0,24	0,24			0,25	0,72
1990-2000	2,75	1,37	0,68	0,01	0,22			0,47	0,69
2000-2004	2,51	0,83	0,83	0,01	0,43			0,41	0,66
1980-1990	2,61	0,91	0,72	0,24		0,58	-0,09	0,25	0,72
1990-2000	2,75	1,37	0,68	0,01		0,23	-0,01	0,47	0,69
2000-2004	2,51	0,84	0,83	0,01		0,40	0,02	0,41	0,66

 Table 1

 Results from growth accounting components, 1980-2004

Source: *own calculation based on data from GGDC and AMECO Databases*. Notes: we used the Gross Fixed Capital Stock (GFCS) and GDP in constant prices.

Apart from these links with the cycles, it is worth mentioning that the decline in productivity growth as observed in some OECD countries contests the longrun sustainability of high employment growth (*EC*, [2005]). These doubts are reinforced by possible risks of a decline in labour supply. Indeed, lower labour supply with an increase in labour demand may cause labour shortage sooner than otherwise, implying that the recovery will be jobless or *job-low* growth. A possible interpretation is that companies will not hire new employees in periods of recoveries but rather opt for different strategies to improve their productivity.

#### 3. Conclusion

This paper was concerned with the phenomenon of jobless growth. It concludes that the relationship between economic growth and changes in labour market transformed trough the last few decades. The author was pointed out that the theme is not a purely macroeconomic problem. Hence, this paper was shed light on the main approaches of jobless growth theories. The role of structuralshifts, the crowding-out effects of loosening fiscal policy and public employment, the interactions of labour market institutions were seemed to be essential to understand this phenomenon.

According to the growth accounting results, the employment and participation rates played key role in economic growth beside the TFP, with a

change of magnitude similar to that of physical capital accumulation. Nevertheless, some other—i.e. unemployment—rates less influenced economic growth. Hence, further and more relevant research should aim to reveal the main features and effects of jobless growth phenomenon.

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