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Labour Gap by Sector of Economic Activity: The Case of Athens, Greece (1995-2001)

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Abstract: The present paper estimates potential labour and labour gap for the case of the Athens Territory in Greece by sector of economic activity, using the Non Accelerating Wage Inflation Rate of Unemployment (N.A.W.R.U.) concept. The results show that the Athens territory seems to be working over the regional economy's capabilities in terms of employment, a fact which leads to inflationary pressure.

Key words: Regional development, town planning, labour gap, NAWRU, sustainable development, Athens.

1. Introduction

The efforts being made to implement European Union (E.U.) policies and to deliver the Olympic Games of 2004 are said to have facilitated the creation of a new role for Athens, the capital of Greece, as a modern international and sustainable urban region [1]. The purpose of the present paper is to assist decision makers to implement certain policies effectively. More precisely, a key question is related to the level of real labour in the broader Athens Territory and its deviation from potential labour, namely the labour gap.

In recent years, economic policy has placed increasing emphasis on labour gap even though it cannot be observed directly and its measurement is difficult [2]. When total labour is well below the potential of the (local) economy (so called potential labour associated with a desirable level of labour) then a negative labour gap exists. In simple terms, current labour is below what the economy could normally sustain. In this situation there is spare labour capacity in the economy. The implication is that the rate of inflation is likely to fall because inflationary pressure is falling. When actual labour lies well above potential labour, there is a positive labour gap, meaning that inflation pressures will be rising. The labour gap is unlikely to persist over the long-run, as it is supposed that there will tend to be a wage and price adjustment process to restore equilibrium, where demand and supply are equal [2]. This often happens to a region at the end of a period of sustained economic growth, well above the long-term average growth of national output [3].

The Athens Region seems to fulfill this criterion; In brief, it captured benefits in the pre Olympic period, it enhanced its competitiveness and is said to have improved its governance [1].

The structure of this paper is as follows: in section 2, the Athens area is briefly presented; in

section 3 the methodological framework for measuring potential labour and labour gap is discussed; in section 4, the labour gap in Athens is estimated and the empirical results are presented and discussed; finally section 5 concludes the paper.

2. The Athens Urban Territory

The structure of regional activity in Greece consists of thirteen (13) regional departments/areas. A significant characteristic of the thirteen regional departments of Greece is the over-accumulation of population in the Attica Regional Department, from now on called - for reasons of convenience -, the Athens Territory (34.31%), and in Central Macedonia (9.64%) adding up to, approximately, a very high 44% of the total population of the country, in 2001. Meanwhile, these two regions produce about 54% of the Gross National Product (G.N.P.) and accumulate 55% of aggregate employment, i.e. 38% and 17%, respectively [4].

More precisely, over the 1991-2001 period, the population of Greece increased by 6.8%, while the Athens Metropolitan Area grew also at 6.8%, thus maintaining its share of about one third of the total Greek population and was mainly due to suburbanization driven by new infrastructure projects in outer areas[1] confirming its dominant position as the main urban center of Greece. Consequently, Attica, and especially Athens (as well as Central Macedonia), constitutes a very significant poles inside the Greek territory.

Athens needs clear strategic planning to take advantage of the opportunities that globalisation and eastward expansion of the European Union is bringing. In fact, Athens has strong potential for development in its role as international gateway to Greece, the eastern part of the enlarged European Union and the Middle East. However, fulfilling this role will require strategic responses from the Greek government and the authorities of Athens and the surrounding region of Attica to a number of specific challenges [1].

In particular, there is a need for developing a strategic vision for the region linking economic, social, and environmental planning. The government should monitor the impact of E.U. enlargement on the Greek and Athens Region economies and develop a clear analysis of the best roles for Athens to play within Europe.

[1] These are associated with the location of the new Athens International Airport, which provided significant employment opportunities.

The competitive position of the Attica region has improved over the fifteen years, thanks to favourable economic developments. Annual growth rates in Greece of around 4% in the last few years have been higher than in most other EU countries; there has also been greater stability following entry into the Euro zone and a programme of regulatory reforms has liberalised many state dominated sectors.

Since the final decision was taken, the preparations for the Olympic Games in 2004 and financing from EU Community Support Funds had boosted investment in the hotel sector, year-round sports facilities and a modern region-wide transport network. This included a brand new international airport, urban highways and ring roads to decrease congestion, upgraded rail links, a new metro, a non-polluting bus fleet, and tramway lines which connect the city centre and the suburbs. A programme to enhance architectural heritage and environmental assets has transformed central Athens and, like other European cities, Athens now boasts easy access to a landscaped coastal zone which offers a wide range of leisure activities.

At the same time, however, Athens faces complex inter-related problems. Its population is ageing; immigration is increasing in a previously homogenous society; parts of the urban area suffer from poor housing, environmental degradation and lack of green space, and the impacts of climate change in a sensitive semi-arid area are cause for concern; unemployment in the capital is high; imbalances in employment opportunities may well arise between the east and west of the region as well as among the different sectors, since new developments locate around the international airport, while old industrial sites in the west require redevelopment; investment finance may become scarce in the medium term as the EU Community Support Funds diminish and the investments connected with the Olympic Games are concluded.

Against this background, following O.E.C.D. [1], Athens has considerable potential for growth in a number of areas. Specifically, it cites the health sector, including the fitness and health industry; the sports sector with hosting of major international events; education as an economic sector attracting foreign students which stimulates the housing and construction sectors as well as consumer products; the legal sector; the year-round conference industry; and new forms of tourism such as archaeological parks, eco-tourism, and high-quality cultural tourism.

All of these opportunities, however, require the Attica region to be well planned, accessible and

socially and environmentally agreeable. Like many metropolitan areas, Athens requires new institutional arrangements or reinforced co-operative arrangements in order to improve integration across administrative areas, between the policies and programmes of infrastructure agencies and service delivery, and between levels of government.

In the framework just presented, the present paper measures the labour gap in the Athens Region by sector of economic activity, in an attempt to assist decision makers to implement certain employment policies effectively.

3. Methodological Framework

Potential labour is estimated using the N.A.W.R.U. (Non Accelerating Wage Inflation Rate of Unemployment) concept. The N.A.W.R.U. is the unemployment rate at which wage inflation is constant. Several studies show that the equilibrium unemployment rate changes over time, but it generally follows the actual unemployment rate [5].

Elmeskov's [6] popular method is used in this paper to construct a time varying N.A.W.R.U. This approach has also been by various researchers, for example see Bolt and van Els [7], to estimate the output gap in European Union (E.U.) countries, and in Slevin [2] for the case of Ireland. It is based on an equation, which relates changes in unemployment with those in wage inflation:

$$u_t - N.A.W.R.U_t = \lambda \Delta^2 w_t, \lambda<0 \quad (1)$$

where u_t is the actual unemployment rate, $N.A.W.R.U_t$ is the (natural) unemployment rate, which has no effect on wage inflation and w(t) is the average gross wage. Δ is the first difference, Δ^2 is the second difference and Δ^3 is the third difference operator.

Taking left and right first differences of equation (1) leads to an equation for λ:

$$\lambda = \frac{\Delta u_t}{\Delta^3 w_t}, \Delta^3 w_t \neq 0 \quad (2)$$

inserting the latter (2) into equation (1) we get:

$$N.A.W.R.U_t = u_t - \frac{\Delta u_t}{\Delta^3 w_t} \Delta^2 w_t \quad (3)$$

Equation (3) implies that the N.A.W.R.U. is equal to the actual unemployment rate, which is adjusted by unemployment rate changes and wage inflation relationship. The resulting series is then smoothed to eliminate erratic movements using the HP filter. Consequently, potential employment is calculated as follows:

$$L^*_t = L_{s_t} [1-NAWRU_{s_t}] \quad (4)$$

where L_{s_t} is the HP-filtered labour time series and $N.A.W.R.U_{s_t}$ is the HP-filtered NAWRU time series.

Labour Gap is then calculated as follows:

$$L_{gap} = (L_t - L^*_t)/ L^*_t \quad (5)$$

where L_t is the actual labour time series.

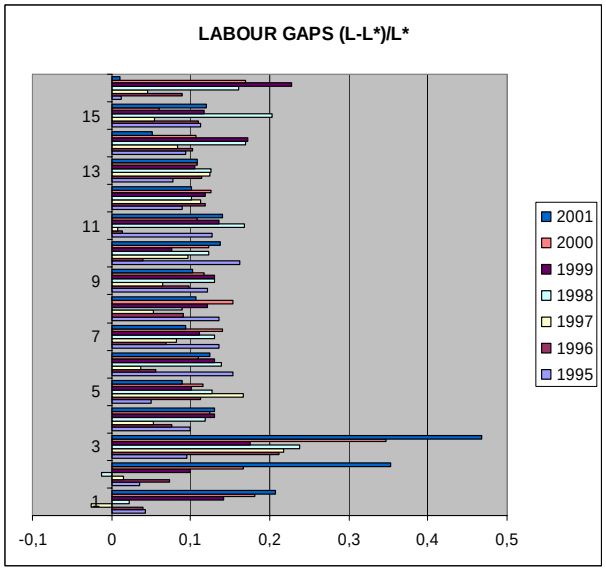
4. Empirical Results

The regional data come from the National Accounts of the National Statistical Service of Greece [4], are on an annual basis and cover the period 1995-2001, by sector of economic activity.

More precisely, the time series on actual labour comes from the National Accounts concerning the reported sixteen (16) sectors of economic activity (see Table 2, Appendix). Also, because the relevant data are not available, the wages by sector of economic activity in Athens were calculated under the assumption that the sectoral wages at the national level are equal to the corresponding wages of the Athens Territory. This assumption is supported by the fact that about 38% of the total number of employees in Greece work in Athens. Also, we have made the same assumption about the unemployment rate since no relevant data for each sector of economic activity in the Athens Region is available.

Figure 1 illustrates the labour gap, by sector of economic activity for each year.

Figure 1: Labour Gap by sector of economic activity in the Athens Regional Department (1995-2001)



In the following table (Table 1) the labour gaps are presented in greater detail.

Table 1: Labour Gap by sector of economic activity in the Athens Regional Department (1995-2001)

	1995	1996	1997	1998	1999	2000	2001
1	0,0421	0,0405	-0,0254	0,0219	0,1423	0,1810	0,2077
2	0,0349	0,0739	0,0156	-0,0119	0,0994	0,1666	0,3529
3	0,0946	0,2111	0,2171	0,2375	0,1751	0,3467	0,4679
4	0,0998	0,0755	0,0530	0,1189	0,1300	0,1243	0,1307
5	0,0500	0,1126	0,1664	0,1276	0,1011	0,1153	0,0890
6	0,1540	0,0560	0,0365	0,1391	0,1305	0,1095	0,1242
7	0,1355	0,0693	0,0827	0,1308	0,1109	0,1404	0,0932
8	0,1358	0,0912	0,0523	0,0895	0,1216	0,1533	0,1067
9	0,1207	0,0983	0,0648	0,1307	0,1307	0,1172	0,1031
10	0,1615	0,0404	0,0970	0,1227	0,0769	0,1225	0,1370
11	0,1267	0,0134	0,0082	0,1678	0,1361	0,1084	0,1399
12	0,0887	0,1184	0,1125	0,1004	0,1178	0,1254	0,1013
13	0,0770	0,1135	0,1248	0,1263	0,1051	0,1084	0,1082
14	0,0933	0,1024	0,0839	0,1690	0,1730	0,1061	0,0514
15	0,1120	0,1098	0,0539	0,2027	0,1175	0,0600	0,1195
16	0,0124	0,0888	0,0459	0,1604	0,2276	0,1700	0,0106

The empirical results show that in the time period 1995-2001 the Athens Territory seems to be operating, with very few exceptions, at levels of employment which are higher than its capacity. This also implies that the actual employment levels achieved are higher than the ones that would *not* cause inflationary pressures.

Also, we observe that the largest labour gaps are to be found for sector 1 (agriculture, farming and forestry), sector 2 (fishing) and sector 3 (mining), i.e. the primary sector of production. This finding, i.e. the over-utilisation of labour, can be characterised as expected given the fact that this sector of economic activity is one in which, traditionally, the Athens area is not specializing. Of course, this finding is also an expression of a very important structural problem of the Greek economy as a whole, especially when compared to other European countries. Finally, the rest of the sectors face a similar range of gaps, among them, indicating an almost similar and homogeneous diffusion of the gap in the regional economy.

After 1998, as can be seen in Table 1, potential labour tends to rise, a phenomenon which can also be characterised as expected, since the convergence plan of the total economy in the 1998-2001 time span has lead to a gradual decrease of N.A.W.R.U., which in turns had an increasing effect on potential labour, combined with the Olympic Games of 2004 preparation period [8].

Meanwhile, the N.A.W.R.U. in the Athens Region was higher than the actual rate of unemployment in the time period 1999-2001, a fact which implies that the inflationary pressures of the period are related, ceteris paribus, with the unemployment decline.

5. Concluding Remarks

In the present paper we estimated 'potential labour' and 'labour gap' by sector of economic activity in the Athens Regional department with the aid of the NAWRU concept in an attempt to examine whether the Athens economy is operating at levels over its capacity, which in turns could be blamed for inflationary pressures. The results show that the sixteen sectors of economic activity do operate over the local economy's capacity and are responsible for creating inflationary pressures.

It is well known, that in periods of expansion, the economy can function above the levels of the corresponding trend line [8], that is to say the real magnitudes are larger than the corresponding potential ones. The opposite happens in periods of recession. In this framework, and given the expansion of the Athens economy, our findings can be regarded as expected. Thus, we can suppose that, when the activities connected to the expansion of the economy are completed, and the employment reaches its potential value, then the unemployment rate of the Athens region will probably increase.

This finding seems to be in accordance with the most recent evidence concerning the Greek economy as a whole. More precisely, the unemployment rate for year 2004 has increased significantly when compared to its prior values [9] signifying the end of a long period of expansion related to the Olympic Games in the Athens Region.

Conclusively, we believe that future and more extended research on the subject would be of great interest, including the estimation of the output and productivity gap of the Athens Region.

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Appendix

Table 2: Industry Classification

Sector	Description
1	Agriculture, Farming, Forestry
2	Fishing
3	Mining
4	Manufacturing
5	Electrical Energy, Natural Gas, Gas, Watering
6	Construction
7	Retailing, Car, Motorcycles and Home Device Repairing
8	Hotels and Restaurants
9	Transportation, Storage and Communication
10	Finance and insurance
11	Real estate and business services
12	National defense and public administration and social security
13	Education
14	Health and Social Security
15	Other Social and Personal Activities
16	Private Households with Employed Persons