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Neumann, Michael

Working Paper

Do Larger Nations Have Higher Unemployment Rates?

Bayerische Julius-Maximilians-Universität Würzburg

Wirtschaftswissenschaftliche Fakultät

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Bayerische Julius-Maximilians-Universität Würzburg

Lehrstuhl für Volkswirtschaftslehre, Wirtschaftsordnung und Sozialpolitik

Sanderring 2

D-97070 Würzburg

Tel.: 0931-312925

Fax: 0931-312774

Email:

michael.neumann@uni-wuerzburg.de

I. Introduction

Unemployment is still widespread across Europe. But while some nations are very successful in fighting their unemployment, others are still facing the same unemployment problems as years ago. A common explanation for this is the existence of different labour market institutions. If rigid institutions are established, this will make for an inflexible labour market and create unemployment – this much is common knowledge. It is more difficult to explain why only some of the nations have these unemployment problems. Assuming unemployment is not wanted and assuming rational individuals in all the countries, the existence of rigid institutions and high unemployment for institutional reasons in only some of these countries cannot easily be explained. An exogenous difference in any underlying parameters is needed for explaining the differences in the persistence of unemployment rates among countries. Country-specific preferences may be a reason, but they are difficult to believe in, looking at the European integration process.

The size of the nation's area appears to be one possible exogenous reason. The theory presented here is based on an idea of Gilles Saint-Paul (2000), who described unemployment as part of an equilibrium on political markets. Adding to this the idea of agglomeration rents (see Baldwin/Krugman, 2004) in some regions, it can be explained why some nations want to fight their unemployment more vigorously than others. The distance covered by labour market institutions plays an important role, because distance determines the extent of the agglomeration rent, and agglomeration rents are important for explaining the political choice of labour market institutions. According to this, Europe's larger nations in area should be likely to have higher unemployment rates.

Chapter 2 briefly depicts European unemployment figures. Chapter 3 gives an excursive overview of common explanations for European unemployment. In chapter IV the concept of the agglomeration rent is explained, and Chapter V develops the ideas of Saint-Paul. Then it is shown empirically that, and under what conditions, larger nations have higher unemployment rates (chapter VI). Lastly, the results are supported by some further facts (chapter VII), followed by the concluding remarks.

II. The Facts: High Regional Unemployment in Europe

Both the extent and the persistence of unemployment rates differ considerably among the OECD countries. Today the United States exhibits a much smaller unemployment rate than the member states of the European Union. While the United States' unemployment rates have never shown a long and strong increase, but have ever been very volatile, European unemployment (EU15) started steadily increasing in the 70's from 2% to more than 10% in the early 1990s. One can observe two cyclical declines at the end of the 1980s and of the 1990s, but in both cases, unemployment has been rising again thereafter.

Yet not only do large differences exist between the member states of the European Union and the United States, these differences are considerable within the European Union as well. The ten new member states have a higher average unemployment rate than the EU15, but most notable are the differences even within the EU15. Table 1 presents the unemployment rates of the EU15 for the years 1994, 1999 and 2004. In addition, it shows these numbers with respect to the European average unemployment rate. In the late 1990s, Europe as a whole experienced a clear reduction of its unemployment rates. In recent years, however, unemployment figures have risen again. Assuming an influence of business cycles, the figures are corrected for the European average. To the extent that an economic slump affected Europe as a whole, this influence is eliminated. But this influence is not yet everything corrected by using the European average rate as a denominator. The relative rates also show which of the countries were more successful than the average, and which of them, though they were successful in the reduction of unemployment in terms of their absolute figures, lagged behind the average. In the last column, it is shown whether a clear trend can be observed.

Table 1 Unemployment Rates Over Time (EU15)

|	1994	1999	2004	1994	1999	2004	trend
EU-15	10,4	8,5	8,1	1	1	1	
Belgium	9,8	8,6	7,9	0,94230769	1,01176471	0,97530864	
Denmark	7,7	4,8	5,4	0,74038462	0,56470588	0,66666667	
Germany	8,3	7,9	9,5	0,79807692	0,92941176	1,17283951	negative
Greece	8,9	12,0	10,5	0,85576923	1,41176471	1,2962963	
Spain	19,8	12,9	11,0	1,90384615	1,51764706	1,35802469	positive
France	11,7	10,5	9,6	1,125	1,23529412	1,18518519	
Ireland	14,3	5,7	4,5	1,375	0,67058824	0,55555556	positive
Italy	10,6	10,9	8,0	1,01923077	1,28235294	0,98765432	
Luxembourg	3,2	2,4	4,8	0,30769231	0,28235294	0,59259259	
Netherlands	6,8	3,2	4,6	0,65384615	0,37647059	0,56790123	
Austria	3,8	3,9	4,8	0,36538462	0,45882353	0,59259259	negative
Portugal	6,9	4,6	6,7	0,66346154	0,54117647	0,82716049	
Finland	16,6	10,2	8,8	1,59615385	1,2	1,08641975	positive
Sweden	9,4	6,7	6,3	0,90384615	0,78823529	0,77777778	positive
United Kingdom	9,3	5,9	4,7	0,89423077	0,69411765	0,58024691	positive

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In two countries only (Austria and Luxembourg), unemployment has always been low since 1994, while other countries have experienced a strong decline in recent years. Ireland, the Netherlands and the United Kingdom must be mentioned particularly here. In Sweden, Denmark and Finland, unemployment went up sharply until the middle of the 1990s, however, it declined sharply thereafter as well. Belgium and France were successful in reducing their unemployment rates, but compared to the European average this success was a small one. Only two nations show a negative trend, yet, in the case of Austria, this is a result of the three years selected in the table. Besides, the extent of unemployment is quite small in Austria so that one does not have to view this trend with too much concern. Thus, Germany is the only country which had to experience a permanent rise in its unemployment rate. Over the last decade, European unemployment rates show a clear convergence, however, there are still significant differences. The unemployment rates in France, Greece, Spain and Germany are still above 9%. This is more than twice the rate of the Netherlands and of Ireland. Even adjacent countries such as Portugal and Spain have shown completely different labour market results despite similar historical conditions (Blanchard/Jimeno, 1995), but now these two seem to be converging gradually as well.

Whereas the differences among the nations are diminishing, the regional unemployment rates show no signs of convergence (European Commission, 2001; European Commission, 2005). Figure 1 illustrates the regional differences. Graphics can be read as follows: At the vertical axis the nations are listed. The middle of each nation's two bars represents the national average unemployment. For example, in Germany an average unemployment rate of 9.4% can

be observed. From the national average one bar leads horizontally to the right and the other one to the left. The bar leading to the right indicates the maximum regional extent of unemployment in Germany. Halle as the region with the highest rate in Germany shows an unemployment rate of 27.1%. The deviation from the German average to the left shows the region with the smallest unemployment. This is Oberbayern with 3.8%.

Figure 1 Regional Unemployment in Europe[1]

■ deviation of the region with the lowest unemployment
□ deviation of the region with the highest unemployment
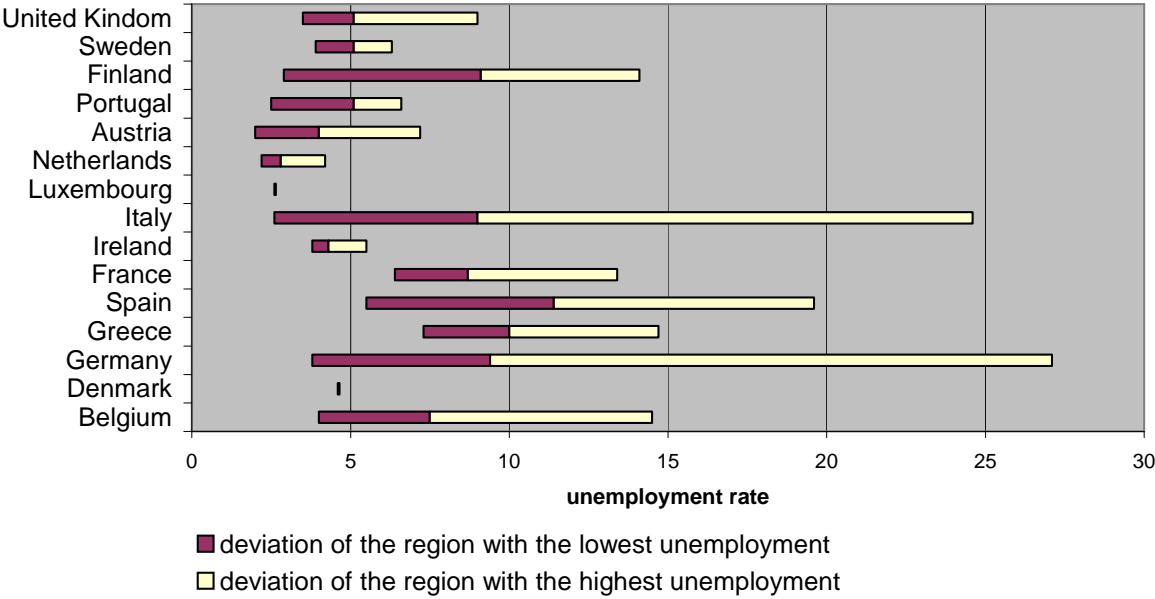
Eurostat Database

Thus, national and regional differences can both be compared in this figure. The nation with the smallest unemployment is Luxembourg. The highest national average unemployment is exhibited by Spain, whereas the region with the highest unemployment can be found in Germany. In Italy, important differences in the numbers of the unemployed can be observed as well. While Trentino Alto Adige shows an unemployment rate of just 2.6%, the rate in Calabria reaches 24.6%. Spanish regional unemployment rates differ from 5.5% in Aragon up to 19.6% in Andalusia. Almost any larger country has regions with high unemployment. France, Germany, Greece, Spain, Italy and Finland all show a difference of at least seven percentage points between the unemployment rates in the regions with their smallest and those with their highest unemployment. Looking at a map, you will be disposed to divide each nation into a region being the economic core and another region being the periphery (such as Eastern Germany, Southern Italy), where the unemployment rate is particularly high.

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[1] French overseas departments are not included here.

III. Some Explanations: On Shocks and Institutions

Explanations for high European unemployment are usually based on the interaction of shocks and institutions (Blanchard, 2005). Mayor shocks for Western Europe were the oil price increases in 1973/1974 and 1979/1980 and the slowdown of the total factor productivity in the 70's. A shift in the course of monetary policy to counter inflation (in order to establish European Monetary Union), a change in the labour demand linked to globalisation and labour saving technical progress and a more volatile economic environment can be added as well as some country-specific shocks such as the breakdown of the former Soviet Union (for Finland) and the German reunification.

These shocks required either a decrease of the wages or at least a smaller increase of wages than before. Furthermore, a flexible and dispersed wage structure has become necessary. But European wage setting institutions have not responded, the bargained wages grew faster than the warranted ones. In order to understand this development, the differences in real and nominal rigidities between the European countries have been used to explain why the same shock could cause a different increase of the unemployment rates. The negative impact of overdrawn wages on capital accumulation and the "insider-outsider theory" by Lindbeck and Snower (1988) could both explain why unemployment was persistent after the shocks and why it increased even further. Fundamental to the "insider-outsider theory" is the existence of different types of labour turnover costs, which create economic rent and give market power to the employed workers, called insiders (Lindbeck, 1993). This power can be used to force wages above the market clearing level without running the risk of dismissal. The unemployed, called "outsiders", bear the costs in the form of unemployment. The theory is closely connected to the existence of trade unions and the degree of collective bargaining. Wage bargaining in Europe typically takes place between the representatives of the employed workers and of the firms, whereas the unemployed are not involved. Unions caring only about the prospects of the currently employed will try to implement a wage so that employment remains the same. The interests of the unemployed are neglected in the bargaining process. On that account, the theory is very convenient to explain the persistence of unemployment. Another explanation is based on the role of human capital: a long duration of unemployment would lead to a loss of skills, lower the pressure of the unemployed on the bargained wages and make unemployment persistent as well (Layard/Nickell, 1987). However, for explaining the long time period of high European unemployment and the differences of unemployment

throughout Europe, the labour market institutions of the European nations are commonly considered to be the most important reasons.

On top of the list is the centralisation of wage bargaining. For a long time, centralised wage bargaining has been claimed by many economists to be an appropriate institution concerning wage-setting and unemployment, for it allows the internalisation of externalities particularly with respect to inflationary pressures (Calmfors/Driffill, 1988; Blau/Kahn, 1999). This claim has been supported by presenting empirical cross-country evidence of a hump-shaped relationship between the countries' degree of bargaining centralisation and their nation-wide unemployment and inflation performance. Whereas centralised (at the economy-wide level) as well as decentralised (at the firm level) wage bargaining exhibit good results, the outcome for bargaining at the sectoral level has been analysed to be the worst. Yet for centralised bargaining it is a crucial condition that the same wage is paid for the same job without respect to the region where the firm is located or to the economic situation of the firm in which one is employed. This means that good results depend on workers with similar educational background, experience and profiles, having similar productivity as well as on a similar productivity of similar firms in different regions. In a globalised and more volatile world, these conditions are problematic, particularly in heterogeneous countries, where productivity is very uneven across regions. Only decentralised wage bargaining can cope with the challenges of globalisation, a volatile economy and large regional differences. Equal pay for equal work is very likely to lead regions with a lower productivity to higher unemployment. In 1994 indeed, the famous OECD job study thus recommended a more decentralised bargaining.

Another institution often seen as one major explanation for unemployment is the employment protection legislation. It is not that obvious whether and how EPL affects labour market performance. Not only might some EPL be justified for reasons of equity, but for efficiency reasons as well. EPL can internalise some of the social costs which employers impose on society in dismissing staff, if those dismissed receive governmental transfers in case of unemployment. Furthermore, EPL is able to smooth employment over the business cycle because firms will be more reluctant to fire workers in recessions as they must bear the costs of dismissal in the form of severance payments, or they must face the prospect of dismissed workers (being paid for) continuing to work, but unproductively, while they are still protected. Additionally, in a more specialised world firm-specific human capital is of prime

importance. EPL can tighten the working relationship between firms and workers thus encouraging workers to invest more in firm-specific human capital. However, EPL unambiguously reduces the flows in and out of unemployment by creating additional labour turnover costs. Once dismissed, it is more difficult for workers to obtain a new job, the higher the level of employment protection is. For this reason, EPL increases the segmentation of the labour market by giving the insiders more market power. The reduced hiring rate makes unemployment more persistent.

The generosity of insurance and transfer payments to the unemployed are commonly considered to be the third important institutional determinant for the extent and duration of unemployment (Layard/Nickel/Jackman, 1991; Nickel, 1997; Blanchard, 2005). High benefits, paid for a long duration without restrictive criteria which govern what is expected of the unemployed in order to be granted these benefits, are a disincentive to work and thus cause unemployment, particularly long-term unemployment. Such benefits make employment at a low wage level appear unattractive. The guaranteed transfer income establishes a de-facto minimum wage. Similar to a real minimum wage (which is additionally implemented in most of the EU countries), it reduces labour market competition by the outsiders. As a result a more aggressive wage bargaining behaviour by the trade unions must be threatened, thus raising the wages further to boost the insiders' income. Often, active labour market policy provides additional support to this institutional setting. Programmes for long-term unemployed or special help for workers in depressed areas are brought into being in order to show political action. Though the intention looks to be good, these programmes reduce the willingness to accept lower wages and the incentives to seek a job elsewhere. On that account, some implications of active labour market policy are similar to those of direct transfer payments to the unemployed.

It can be concluded that a few major reasons for unemployment are well known. They can be used for giving advice to policy makers. Modern economies need to reallocate their resources all the time. Institutions preventing this are responsible for unemployment. Admittedly, it is not completely clear why unemployment is that high in just a few European countries. Knowing that institutions matter does not mean knowing which of them exactly plays what role and how they matter in any special case. Blanchard (2005) highlights the comparison of Spain and Portugal. Both countries are historically similar cases, both have similar institutions, but both have shown extremely different unemployment rates so far.

Furthermore, it is not necessary to compare two countries with different institutions. You can also take one country such as Germany (or Italy) to find both high and low rates of unemployment within one and the same institutional framework.

IV. The Impact of Agglomeration Forces

Significant regional economic differences inside one country are often ascribed to agglomeration processes taking place. Not only does the interaction of shocks and institutions play an important role, but also the interaction of agglomeration forces and labour market institutions is relevant in order to illuminate European unemployment. Agglomeration is usually attributed to external economies of scale. The underlying condition is that the profitability for each firm is the higher, the more other firms are near by. One cause of this externality can be the existence of technological external effects such as knowledge spillovers between firms. Yet for explaining why a European region has become a core, another reason is more appropriate – the existence of pecuniary spillovers will also lead to agglomeration (Krugman, 1991). New Economic Geography (NEG) calls this phenomenon market linkages – and these are either linkages to customer or to supplier firms. In a completely competitive world, these linkages would have no impact on welfare, yet, in a core-periphery-economy, the linkages do matter.

The linkages work this way: producers want to be located where they have good access to large customer markets and at the same time a good access to suppliers of their inputs or required factors. A place with many customers is more suitable than a location without them. More producers in one region in turn attract more customers because they can offer a wider range of supply, more customers means a larger market, that is why one producer will have more customers. The better market access will attract more producers again. A self-reinforcing process will be induced. These effects describe just the opposite of what is expected to occur assuming an allocation of firms according to the concept of neoclassical scarcity. Instead of having less customers, a new competitor in the market raises the number of customers for all suppliers. These linkages work on labour or capital factor markets in a similar way. A spatial concentration of economic activity emerges. Of course, scarcity works against these linkages, but when agglomerative forces dominate, the geographic outcome of

increasing economic integration is the divergence of two initially similar regions into one core and a surrounding periphery.

Since they have better access to markets, an agglomeration rent accrues to the firms in the economic core. In NEG models, this rent is poured out to the mobile factors. They earn more than in the periphery. That is why they are agglomerating in the core insofar as they are mobile enough (Baldwin/Krugman, 2004). The models usually analyse agglomeration for one factor – labour, capital, human capital or the mobile entrepreneur. Nevertheless, if there are such agglomeration linkages, they will make all mobile factors lump together, giving them an agglomeration rent. If there is a positive rent for being in the core, even the most mobile factor will be quasi-fixed then.

One important condition underlying the agglomeration process concerns the distance between the core and the periphery. NEG incorporates transport costs in the form of iceberg costs, indicating that some goods are melting on their way from the place of their production to the place of their consumption. Baldwin/Krugman (2004) have developed a bell-shaped agglomeration rent in "trade openness". The parameter "trade openness" contains product heterogeneity and – more important (as heterogeneity can be assumed to be similar in EU) – transport costs. The idea of the agglomeration rent is as follows: When trade is completely free, agglomeration is useless because market access is always the same, wherever a firm is located. If trade is impossible, agglomeration processes will not take place either because firms could not serve the periphery markets from the core. At intermediate values of trade openness an agglomeration rent exists due to the linkages that are explained above. Whatever the shape of the rent in trade openness looks like exactly, NEG assumes it to be a function of the trade costs between the core and the periphery. Yet as there is only one core and one periphery in a typical NEG-model, there is only one distance to measure. For this reason, the parameter "trade costs" shows different values dependent on various degrees of economic integration, but not on different distances. Nevertheless, distance is important. In reality, one will not be just one core and one periphery, but a map of more or less concentrated regions. The extent of the agglomeration rent in the core depends on the core's distance to the regions delivered from the core – and this distance varies among European countries. This is particularly relevant, as some smaller nations are lucky to have no periphery of their own.

There are increasing quantities of literature explaining the concentration of factors, production and customers in this particular manner. Most of these contributions are limited to the positive explanation of regional clusters. There are only a few contributions dealing with regional unemployment problems linked to agglomeration effects (see for example Overman/Puga, 2002). However, a direct explanatory connection of agglomerative forces and regional unemployment is not usually the topic. The reason is straightforward: For explaining unemployment, wage rigidities have to be assumed. Consequently, at first glance the explanation for unemployment is the same with or without agglomeration taking place. Agglomeration due to increasing economic integration might simply be seen as one other (and region-specific) economic shock.

V. Unemployment and Institutions: The Political Insider

Asking a labour market economist about European unemployment, you are likely to obtain the answer that it is of a structural nature and that a reduction of unemployment requires a change in the underlying institutions. Moreover, this very knowledge is also widespread in public. Obviously, there must be some winners in this institutional setting because it would otherwise have been abandoned a long time ago. A good explanation for this is offered by Saint-Paul (2000). His theory is based on the existence of rents. Only by working in a perfectly competitive labour market can a worker who has lost his previous employment, find a new adequately paid job instantly. But labour markets are not perfectly competitive. The word "rent" is defined as the difference between the wage income earned at the current job and the alternative income outside this job.

If any positive costs of labour fluctuation exist, they create a monopolistic situation between insiders and employers, allowing the employed to demand and achieve higher wages. For this reason, the rent is an appropriate measure of how far wages are above market clearing level. A positive rent means unemployment. The more frictions arise, the more important labour turnover costs exist, the higher is the rent and the more attractive is the inside option at the current employment. So far, this is an idea already known thanks to the insider-outsider-theory. Yet not all frictions are naturally caused. Some of them simply arise due to imperfect observability and foresight, the impossibility of signing a complete wage contract and the heterogeneity of factors and jobs. However, others are caused by the chosen labour market

institutions. EPL is an intuitive example. More protection creates higher labour turnover costs. So, in this sense, there is an additional rent created by a stronger EPL.

Employed workers are acting – so Saint-Paul's theory goes – similar to the insider-outsider-theory of Lindbeck and Snower, but they do so on the political stage as well. First, they must set the stage to monopolise the labour supply. They organise themselves in labour unions to achieve market power on the labour supply side. Then the unions try to implement a wage above market clearing level to settle the claims of their members. Centralised bargaining at least at a sectoral stage is important to obtain the monopolistic status, and thus, the higher wages. Second, the higher the labour turnover costs are, the less competition is to be feared from the side of the unemployed. High EPL therefore is a useful instrument for employed workers to avoid pressure on their wages. In the political process, employed union-workers are likely to vote for high EPL and centralised bargaining.

Third, there must exist a fixed factor, whose quantity does not change when the input of union-workers is reduced. Only if there is such a fixed factor, can an increasing wage redistribute income from the fixed factor to the union-workers. Saint-Paul admits that this idea is nothing new but just the traditional conflict between capital and labour – as long as capital is the fixed factor. Yet since capital is said to be the mobile factor today, Saint-Paul decided to focus on human capital as the immobile factor instead. On this basis, he developed a conflict between more and less skilled workers. The less skilled workers exploit the more skilled ones. Admittedly this conflict described by Saint-Paul does exist in Europe. But focussing only on this one, the explanation will be inadequate.

Agglomeration forces make all the mobile factors partly immobile in the respective core. Up to the agglomeration rent, they can be expropriated without moving into the periphery. One may argue that these factors have the choice of going to another core (as there are a few core regions in Europe), but remember that distance matters. Not many mobile factors are really footloose, because they may lose access to the specific national market, if they move (otherwise we should observe only one core region for the whole of Europe). For this reason, the mobile factors are exploitable – and it is consequential that the immobile workers in the core will try to get their desired share of the agglomeration rent.

Now the political equilibrium can be outlined. There is one group – the employed union-workers – who are in favour of rigid labour market institutions. The support comes from the employed workers in the core. But not all of them are backing any rigid institutional setting because higher rents also mean a higher risk of becoming unemployed. This risk harms the employed, hence, only a subset of employed workers will vote for the rigidities. Owners of mobile factors will be against the institutional rigidities as will the unemployed (assuming that they are informed well enough). However, their disapproval of the institutions is dependent on their transfers while unemployed. After all, high benefits to the unemployed are a necessary part of the scenario to keep the unemployed quiet.

VI. European Unemployment and the Size of the Nation

Observing political markets in European countries, the story outlined appears to be not far from reality. In many countries, it is common knowledge and frequently published that institutions are too rigid, but no reforms are taking place. The subset of employed workers in the core obviously represents a politically powerful group. Based on the outlined theory including agglomeration rents, it is now possible to explain the regional differences of European unemployment rates.

Let us first assume a small country, where industry has agglomerated. It is so small that all employees can work in the industrial core. Centralised institutions chosen by the majority or under the strong political pressure of employed union-workers are likely to bring high wages, all the rigid institutions described above, and, consequently, some unemployment as well, but without losing the mobile factors. Now consider another small country, where there is not that much industry agglomerated. This country can be viewed as a periphery. There are no mobile factors, and consequentially, there is no rent to exploit. Wages can be set above the market clearing level, but this is not as profitable as it is in the core. Admittedly, even in countries, which you would classify as a periphery, there is a small core and there are small income differences. Therefore, a small rent is arising, and collective bargaining and centralised institutions can be established to annex this rent. However, there will be only a low unemployment rate as well, for the rent is small, and this limits the bargained wages.

On the other hand, assume two large countries with both a core region and a periphery. Many union-workers are supposed to be not mobile enough to supply their labour in the core. Now the subset of employed workers is divided: The workers in the core want the agglomeration rent in the core to be shared. They are willing to accept some unemployment to achieve higher wages and get their share of the agglomeration rent. The workers in the periphery will not favour this wage. They are less productive than those in the core, so they were not able even to cope with a wage that would be just market-clearing in the core. In a country with a small core and a large periphery, the outcome could be the same as in the small country that consists of periphery only, if the majority is represented by a periphery worker.

But if there exists a large industrial core in such a country, the political power is likely to be held by a worker in the core. In case of having centralised institutions (which means that political decisions are effective in the whole country), the outcome will be one of high wages (like in the small country with an industrial core), of exploiting the rents of the agglomerated area, though the periphery cannot cope with the bargained wage. High unemployment arises. Firms which would have remained in the periphery, if they had not to pay core wages, will also leave. Moreover, even the immobile workers, having lost their jobs, only have the alternative of remaining unemployed and receiving benefits from the government or of moving to the core. Yet in the core they would be unemployed, too. This can raise unemployment in the core as well. In this very country, the outcome is excessively high unemployment in the periphery and a higher unemployment than in other core areas as well. Additionally, high unemployment benefits, active labour market policy and central government spending in the periphery are likely to be used to keep people there (because of the unwanted competition), and interregional transfers alleged as help prevent the financial collapse of the poor region.

The influence of distance is one of the most important assumptions for explaining regional agglomeration as well as the extent of the arising agglomeration rent. Thus, it may be supposed that the size of the area which is covered by a setting of institutions has an important impact on unemployment by creating agglomeration rents. In Europe, labour market institutions are usually implemented by nation states on the national stage. Hence, small countries, having either no core region or no periphery region, should have no unemployment problems, whereas in large countries having both kinds of regions higher unemployment rates

are likely to be found. Figure 2 shows that there is indeed a very strong correlation between the geographical size of a nation and its unemployment rate.

Figure 2

Unemployment rate (2004) and nation's size in EU15[2]

$R^2 = 0,38$
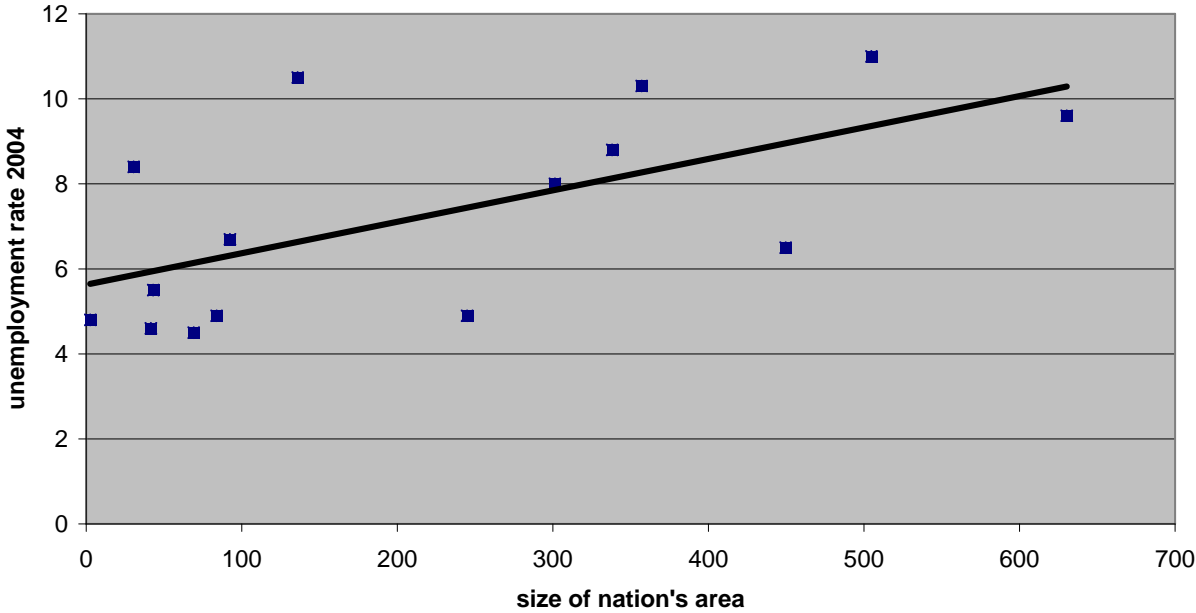
Eurostat-Database

We have also proved correlation for several years. The equation of the OLS-regression for each year reads as follows:

$U=c+\beta d +u,$

where U is the unemployment rate, d is the distance (the root of the country's size) and u the residual vector. B is the estimated coefficient. Note that not area itself but its root is used, because the variable required is one-dimensional[3]. The outcomes of the OLS regression are presented below (table 2).

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[2] We rely on EU15 figures, because it can be assumed that EU15 states have a comparable infrastructure. Thus, area (or its root) is a good measure for distance within a nation. Moreover, EU15 countries can be assumed to be quite similar in terms of their preferences and their amount of human capital, at least in a comparison to other nations such as the ten new member countries.

[3] For larger nations with more than one core, the distance between core and periphery is obviously overestimated by area. This is attenuated by using area's root. A better solution would be to reconfigure the estimator in case of having definitely more than one economic core. For European countries the parameter appears to be suitable, however, Unites States' unemployment would be overestimated by far.

Table 2

Estimated impact: root of area's size (in km^2) on the unemployment rate in EU15-nations[4]

	1994	1995	1996	1997	1998
Constant c	4,89	4,60	4,29	3,55	3,24
Estimated coefficient β	0,0118	0,0114	0,0120	0,0125	0,0116
t-stat. (of β)	2,7	2,9	3,4	4,2	3,9
p-value (F-stat)	0,018	0,012	0,005	0,001	0,002
R-squared	0,36	0,39	0,48	0,57	0,54

	1999	2000	2001	2002	2003	2004
Constant c	2,90	2,62	2,57	2,98	3,87	4,51
β	0,0116	0,0094	0,0086	0,0087	0,0073	0,0066
t-stat. (of β)	3,6	3,3	3,2	3,4	3,14	2,8
p-value (F-stat)	0,004	0,005	0,007	0,005	0,008	0,014
R-squared	0,49	0,46	0,44	0,47	0,43	0,38[5]

Eurostat-Database

The estimation output suggests that the size of a nation has indeed a significant impact on its unemployment rate. This impact appears to be relatively stable over time[6]. Larger European nations can be divided into a core and a periphery, and their labour market institutions are not suited for both of the regions. Smaller countries do not face this problem. And they show significantly lower unemployment rates.

The impact of the country's size on unemployment is assumed to exist because of a stronger divergence of interests between the decisive voter of the national institutions and the workers living in the periphery. Hence, the ratio of the average income in the periphery and the average income in the median income region of the nation should be an appropriate measure for this discrepancy. Remember that a small core with a higher productivity cannot explain high unemployment as long as the decisive voter is not to be found in the core. On the other

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[4] French figures include overseas departments.

[5] By coincidence, the same value of R-squared can be observed using area's size and its root.

[6] Remarkably, the estimated coefficient is getting a little bit smaller in recent years. This may reflect falling transport costs in Europe, lowering the agglomeration rent, but it could also be caused by changes in the overall unemployment rates throughout Europe.

hand, a small periphery with a lower productivity than the average is likely to be overruled. This is considered in the next step. The descriptive statistics are presented first. The first column of table 4 shows the unweighted average of all regions' average income per capita, the second the average income of the median region (all regions corresponding to NUTS2), the third shows the average income per capita of the poorest region, and the fourth column the relation of the third to the second (called "P1rel"). The fifth extends this, showing the unweighted average income of the three poorest regions (as long as there are 3 regions poorer than the average, otherwise the value is 1), and the sixth column again relates this figure to the median ("P3rel"). Column 7 depicts the standard deviation (SD) of the regions' income from their median region. The last column shows the corresponding unemployment rate. All figures are from 2002.

Table 4

Summary of descriptive statistics:

Regional Differences in EU15-nations (in percentage of EU25 average income)

(year: 2002)[7]

year: 2002	I	II	III	IV	V	VI	VII	VIII
Country	Average Income of regions	Median Income	Poorest 1	P1rel	Poorest 3	P3rel	SD (Standard Deviation)	unemploy-ment
Belgium	112,89	103,2	74,9	0,72577519	80	0,7751938	44,36	7,3
Denmark	122,5	122,5	122,5	1	122,5	1	0	4,5
Germany	102,81	102,8	66,5	0,64688716	68,93	0,67052529	26,68	8,2
Greece	75,78	77,3	58,3	0,7542044	59,8	0,77360931	14,08	10,3
Spain	93,13	89	61,6	0,69213483	69,13	0,77674157	18,74	11,4
France	96,35	96,3	57,3	0,59501558	61,5	0,63862928	21,67	9,2
Ireland	119,5	119,5	91,5	0,76569038	119,5	1	39,6	4,4
Italy	107,91	118,3	67,7	0,57227388	70,3	0,5942519	27,4	9,1
Luxembourg	212,7	212,7	212,7	1	212,7	1	0	2,4
Netherlands	116,03	106,3	90,4	0,85042333	94,7	0,89087488	21,06	2,6
Austria	116,71	112,9	81,5	0,72187777	93,77	0,83055802	26,67	4,1
Portugal	76,66	66,5	61,5	0,92481203	62,53	0,94030075	18,82	5
Finland	113,38	99,2	81,9	0,82560484	92,9	0,93649194	29,84	9,1
Sweden	109,59	103,4	97,9	0,94680851	98,9	0,95647969	19,99	4,9
UK	110,41	102,3	72,6	0,70967742	74,9	0,73216031	39,98	5,1

Eurostat Database

At first, note that a larger area entails a higher margin for a lower relative regional income. Of course, this is not a law of nature, but the statistical correlation between the size of the nation (measured in km^2) and the relative income of the poorest region (P1rel and P3rel) can be

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[7] French overseas departments are included.

seen[8]. Interestingly, it is not the dispersion (measured in SD) per se related to the size of the nation (it is almost independent), but the relation of the poor regions' income to their median regions' income turns out to be linked to the size. This is an expected result as this difference is used to measure the agglomeration rent, and this rent is explained mainly by transport costs, that means by distance. Hence, the difference in income of the poor region(s) to the median region is of relevance for explaining national unemployment rates.

Table 5

Impact of the size (in km^2) on the relative regional income

Estimated influence	on P1rel	on P3rel	on SD
Estimated coefficient	-3,43E-07	-3,58E-07	5,93E-06
t-ratio	-2,04	-2,18	0,33
p-value	0,062	0,048	0,744
R-squared	0,243	0,267	0,008

In Table 6 it is estimated how the relative incomes P1rel and P3rel affect national unemployment rates. The results are significant. The national unemployment rate depends on how poor the nation's poorest (one or three) regions are in relation to the median income region. This is compatible with the theory that the interests of the poor regions are neglected in the political process of setting labour market institutions.

Table 6

Impact of having poor regions on the national unemployment rate (2002)

P1rel	Unemployment 02		P3rel	Unemployment 02
Estimated coefficient	-13,28		Estimated coefficient	-13,15
t-ratio	-2,99		t-ratio	-2,94
p-value	0,010		p-value	0,011
R-squared	0,408		R-squared	0,401

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[8] Note that US income is more evenly distributed across regions. This could be one reason for their lower unemployment.

To support theory further, a multiple OLS-regression shows the impact of both parameters. As distance is assumed to cause unemployment by having an impact on agglomeration rents, significance should decrease now for each factor of the regression. The new member states are included here by using dummies. The reason for this particularly is that – for the same distance – trade between core and periphery causes higher transport costs in Eastern European countries as their infrastructure is not as good as in EU15. The regression's equation is as follows:

$$U = c + \beta_1 d + \beta_2 e d + \beta_3 p3rel + \beta_4 e p3rel + u,$$

where U, d and p3rel are defined as described above. Vector e is the dummy variable being 1, when a new member state is observed, and 0, when it is an EU15 country. Having observed heteroscedasticity, white heteroscedasticity-consistent standard errors are used to test.

Table 7

Estimation for EU25

Variable	Estimated β	t-statistics	Probability
c	10,13	1,95	0,065
distance	0,0076	2,25	0,036
distance new members	0,0135	2,38	0,027
p3rel	-8,28	-1,73	0,099
p3rel new members	4,11	1,85	0,079
	R-squared adjusted	0,535	
	observations	25	
	Durbin-Watson	1,79	
	Prob. (F-stat.)	0,0005	

The results confirm the theory throughout Europe. The size of the nation's area impacts the national unemployment rates in Europe, and the mechanism appears to be working in just

the way described in the theory[9]. Generally, it can be concluded that national unemployment rates are lower

- the more equal the nation's poor regions are in relation to the median region,
- and the more decentralised the labour market institutions are designed.

VII. Some further facts

Using a least square regression containing only 25 nations, it is necessary to give some further facts to support the results. This is done nation by nation for all EU15 countries. Some nations are described very well by the empirical analysis, others are not. Table 7 shows the difference of the nations' estimated figures (using distance and P3rel respectively for the estimation) to their observed unemployment rate. Any larger differences have to be explained.

Table 7

Estimated and observed values nation by nation

2002	unemployment rate			difference of	
				value estimated by area and observed value	value estimated by P3rel and observed value
	observed value	estimated by distance (β of table 2)	estimated by P3rel (β of table 6)		
Belgium	7,5	4,5	7,4	-3,0	-0,1
Denmark	4,6	4,8	4,4	0,2	-0,2
Germany	8,7	8,2	8,7	-0,5	0,0
Greece	10,3	6,2	7,4	-4,1	-2,9
Spain	11,5	9,1	7,4	-2,4	-4,1
France	9,2	9,9	9,2	0,7	0,0
Ireland	4,4	5,3	4,4	0,9	0,0
Italy	9,0	7,7	9,8	-1,3	0,8
Luxembourg	2,6	3,4	4,4	0,8	1,8
Netherlands	2,8	4,7	5,9	1,9	3,1
Austria	4,0	5,5	6,6	1,5	2,6
Portugal	5,0	5,6	5,2	0,6	0,2
Finland	9,1	8,0	5,3	-1,1	-3,8
Sweden	5,1	8,8	5,0	3,7	-0,1
UK	5,1	7,3	7,9	2,2	2,8

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[9] According to the theory there should be a very high correlation of area and P1rel respectively P3rel. Hence, we fear multi-collinearity. Nevertheless, for the multiple regression containing both factors see appendix.

Explanations start with Germany and Italy. Both show a large area, a core and a periphery region and a relatively high unemployment rate. **Germany** is the prime example to confirm the theory. After German reunification, all the institutions of the West were introduced in the East without any major modifications. Only the unemployment assistance was defined a little bit lower than in the West. The wages for Eastern Germany were bargained by the social partners of the West, though East Germany's productivity had been much lower than West Germany's. This caused high unemployment in the East. If one adds to this wage bargaining procedure the threat felt by many Westerners of facing low wage competition, the resulting high wages and unemployment rates in the East cannot cause any surprise. They are part of the desired labour market equilibrium for West German workers.

Italy had already taken similar political measures a few decades ago, so Germany's mistake was not new (Sinn/Westermann, 2001). In 1968, wages in Italy were harmonised under the pressure of the trade unions. In succeeding years, the differences in the unemployment rates of the highly productive north and the less productive south grew from only 2.5 percentage points in 1970 to 14.6 percentage points in 1996. Since 1993, Italy has shown some attempts to decentralise, however, both the differences in unemployment and the national unemployment rate are still high.

On the other hand, for rich countries such as Luxembourg, the Netherlands or Austria as well as for a poor country such as Portugal, almost no unemployment problems can be observed. This is caused by the relatively high income of their poorer regions compared to the median region, and it can be put down to the negligible distances as well. **Austria** even shows an unemployment rate of 2.6 percentage points less than expected, when estimated by P3rel, and 1.5 percentage points less than expected by area. A closer look at the figures shows that in Austria it is not the periphery, but Vienna (the richest area) which has the highest unemployment rate. Moreover, the distance between the peripheral Steiermark (P1) and the rich capital is so small that the problem is not living in the periphery but working in the core. This means that area and P3rel may overestimate the influence of agglomeration in Austria. The **Netherlands** also seem to be overestimated for the same reason, and the region with the highest unemployment there is a core region as well (Groningen is the third richest region in the Netherlands). Hence, Austria, the Netherlands and Luxembourg should all be seen rather as a core themselves. **Portugal** is an example of a poor country always having had rigid EPL,

but no high unemployment. Enough wage flexibility and low negotiated wages have been achieved despite a centralised system, for the Portuguese cannot exploit an economic core.

Belgium and Sweden both are good examples to show why not the area itself but the distance and also the income relative to the median region matter most. **Belgium** has only a small area, but area clearly underestimates the Belgian unemployment rate. Due to the sharp economic differences between the Walloon part, the capital and the Flemish part, institutions cannot be suitable for Belgium as a whole. In Sweden just the opposite is true. Since **Sweden**'s poorest region shows an income of 94,68% compared to the median region, distance overestimates the unemployment rates. The small income difference is obviously not enough to create persistent high unemployment. Sweden shows just the unemployment rate that could be expected due to its P3rel value. What cannot be explained by the theory presented here is Sweden's higher unemployment rate during the 1990s and the decline of the rate. Perhaps it was caused by the shock due to a change in wage bargaining from a centralised and co-ordinated system to industry or even firm level bargaining.

The greatest discrepancies between estimated and observed rates, however, are shown by Greece, Spain and Finland. All of them have a higher unemployment rate than expected. Yet the reasons are different. In Finland an unemployment rate of 9,1% is observed. This is almost four percentage points higher than estimated by P3rel. But **Finland** shows a clear trend to a lower unemployment rate for the last 12 years (see table 1). The breakdown of the former Soviet Union might have been the shock that caused the high unemployment in Finland. Regional differences are not that important, hence there is no core dominating the peripheral regions in setting institutions. Finland should soon overcome the shock. **Greece and Spain** on the other side both are notorious for their highly centralised labour market institutions (Bosworth/Kollintzas, 2001; Mauro/Spilimbergo, 1999). Additionally, it has to be taken into account that Greece's size of area underestimates distance in Greece because of the geographical shape of the country and the importance of many islands. Sterea Ellada – the core region and the only one above European average income – is fortunately in the middle of Greece, but still difficult to reach from some peripheral regions.

For **Spain,** you cannot put forward such a statistical excuse. Spanish unemployment is higher than expected with regard to both the area and P3rel – and it was even higher in the past. The reason has been an excessively centralised wage bargaining joined by a rigid EPL, a fairly

generous unemployment benefit system as well as a minimum wage legislation, all of them centralised. Especially setting a nationwide wage floor in sectoral agreements enabled the insiders in core regions to prevent low wage competition from the periphery. Special programmes have been set up to help unemployed in depressed areas, but these programmes have reduced workers' willingness to migrate and seek a job elsewhere (Mauro/Spilimbergo, 1999). Ongoing decentralisation over the last few years has recently lowered unemployment considerably. Especially the possibility for firms to opt out (since 1994) and the agreement between trade unions and entrepreneurs to stipulate negotiations at the firm level (1997) may have been an important help.

France shows almost the unemployment rate as estimated by P3rel. Yet it must be conceded that this good estimation result is only achieved by including the overseas departments with their high unemployment rate. But this is not inadmissible: The departments face the same French laws, and moreover, despite huge differences in underlying economic parameters and in income, a region such as French Guiana shows high wages. In 1999, of all French regions only Ile de France had higher average wages than French Guiana. Excessively high unemployment (about 25%) in French Guiana has been the result.

The **United Kingdom**, often described as a nation having very decentralised labour market institutions, is the counterexample to Spain and Greece. It shows an unemployment rate lower than estimated both by area and by P3rel. Hence, labour market decentralisation is likely to be a suitable instrument in preventing high unemployment rates. For a large nation's government, decentralisation is the only chance to avoid unemployment. The **US** is another example for this. Larger than any European country, they only have a moderate unemployment rate, which can be ascribed to the decentralised institutions in the US. Thus decentralised labour market institutions and, more particularly a decentralised decision-making on the political stage concerning these institutions, are important for larger nations to have low unemployment. But obviously this is a difficult task. Even nations as decentralised as the UK and the US do not reach the low unemployment rates of the Netherlands or Luxembourg. And this is not the end of the scale: Switzerland (41285 km^2; 2.5% in 2002), Liechtenstein (160 km^2; 1.4% (2002)) and Andorra (468 km^2; 0% (estimated in 1996)) are further examples of what small nations can achieve in fighting their unemployment.

VIII. Concluding remarks

The European Union is an institution which is facing large differences in its regional economic performance. There exist a few core regions, but lots of periphery as well. This regional inequality creates an agglomeration rent in the core regions. Core workers are trying to get their share of this rent by setting suitable institutions on the labour market if possible. This is a problem, if one and the same labour market institution contains both the core and the peripheral regions, as the institutions chosen by core-workers make for excessively high unemployment in the periphery. Nations with a larger area are more likely to have both a core and a periphery. Hence, larger nations in Europe indeed have higher unemployment rates, but this is due to the lack of sufficiently decentralised institutions on Europe's labour markets.

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