KATHOLIEKE UNIVERSITEIT
LEUVEN

Vives
Vlaams Instituut voor Economie en Samenleving

VIVES   2011

DISCUSSION PAPER   16

The Competitiveness of Regions
A comparison between Belgian and German Regions

Jozef Konings
Luca Marcolin

Non-technical Summary

This paper uses firm level data to analyze the regional competitiveness of two federal Euro area countries, Belgium and Germany. Competitiveness is defined as the labor cost per unit of output and hence takes into account productivity differences. Analyzing regional competitiveness is important because of the regional concentration in economic activity, the unequal spatial development of regions within countries and the increased importance of regional policy both at the EU as at the national level.

This paper makes first a methodological contribution. Rather than simply comparing labor costs and productivity across regions we propose an approach that takes into account differences across regions in terms of average firm size and sectoral composition. So any remaining difference in competitiveness can be attributed to other factors, such as the institutional setting related to product and labor market regulation, the impact of agglomeration economies, labor market tightness, etc..

We analyze regional competitiveness of the 16 German Länder and the 3 Belgian regions, defined at the NUTS 1 level. In doing so, we use as a benchmark Flanders. We chose Flanders as a benchmark region as the regional innovation score board of the European Commission has ranked Flanders among the top innovators in Europe.

Our main findings are that:

(i)   The Belgian regions, i.e. Flanders, Wallonia and Brussels do mostly worse than the German Regions. While Flanders can be ranked in the middle, Brussels as a capital region scores among the worst, which compares to Berlin, which as a capital region is ranked among the best;

(ii)   It is remarkable that especially the East German regions score the best in terms of competitiveness. They score on average 3 to 5% better than the best region in Belgium, Flanders;

(iii)   This is mainly driven by the strong performance of manufacturing in Eastern Germany, while for services East German regions do not so well.

(iv)   Flanders displays among the highest productivity in the sample, together with Brussels and Hamburg. The gap in competitiveness with Eastern German regions is however driven by low unit labor costs of the latter, which are approximately 70% the ones in Flanders. While there exists a clear relation between labor productivity and labor costs, there has been more labor cost moderation in most German regions, which has resulted in gains in competitiveness.

The Competitiveness of Regions

A comparison between Belgian and German Regions

By Jozef Konings and Luca Marcolin

VIVES, K.U.Leuven

26 January 2011

Introduction

Between 2000 and 2008, GDP per capita in Europe increased by 25.4%, labor participation improved and unemployment fell by 14%. The global financial and economic crisis, however, changed this picture drastically. Between 2008 and 2010 GDP per capita fell by 2.8% and unemployment has been increasing to 9.6%, record high levels since the launching of the Euro. Global imbalances (e.g. USA versus China) are among the root causes that triggered the crisis, just like major imbalances within the euro area has raised the exposure of some Member States to financial turmoil. Such imbalances are most clear from the divergences in price and cost competitiveness. Divergences in competitiveness have been increasing not only between EU Member States, but also between regions within the different Member States. Achieving competitiveness by enhancing productivity and implementing labor market deregulation, including wage moderation, as has been implemented in Germany, seems important for a number of reasons. First, improved competitiveness has positive effects on export performance, which is key to achieve a current account surplus. This is especially relevant when public debt and government deficits in the aftermath of the crisis have exploded. Thus countries with higher competitiveness will find it easier to refinance public debt and to build off government deficits. Reinhart and Rogoff (2010) show in a recent paper that countries with debt to GDP ratio's above 90% grow less, so cutting public debt and restoring competitiveness seems important for achieving long run growth.

In this paper we analyze regional competitiveness. To this end, we focus on the regions in two federal Euro zone countries – Germany and Belgium . These two countries, which at first sight should have similar endowments, yet they seem to diverge in terms of competitiveness. Recently, it has been asserted that Germany is the most competitive country in the Euro zone, which has resulted in a rapid recovery from the global crisis and booming export markets. By and large, the Harz reforms introduced about a decade ago, which were mainly about implementing labor market flexibility and wage moderation in Germany, have been claimed to be at the basis of the current German success. We contrast this to Belgium, which is characterized by rigid labor markets, its high wage policy including wage indexation and which has been considered as losing competitiveness and international market share. Furthermore, in our analysis we will take Flanders as the benchmark region to compare with because Flanders has been ranked among the best performing and most innovative regions by the regional innovation score board (2009) of the European Commission. Of course, within Germany, but also within Belgium, there exists substantial regional diversity. Just analyzing competitiveness of countries seems therefore an inaccurate approach.

Analyzing regional competitiveness, rather than competitiveness of nations, has a number of advantages. First, it seems hard to analyze differences in competitiveness between different country sizes. Clearly the scale effect of a country like Germany is likely going to be different to that of a small country, like Belgium. Second, there exists a lot of heterogeneity between regions within countries. The riddle of unequal spatial development both within countries and across the world has drawn increased attention from policy makers in recent years. For instance the World Development Report of 2009 was entirely devoted to the role of economic geography and the unequal spatial development within the European Union has been at the basis of the European Commission structural fund program. The

economic geography literature attributes the regional concentration of economic activity to a delicate trade-off between agglomeration forces and dispersion forces[1]. Hence by analyzing regional competitiveness it is possible to take into account such agglomeration economies, reflected in for instance geographical concentrations of linked industries or clusters. Third, many countries are characterized by a federal structure with economic decision power delegated to the regional and local levels. Cross-country comparisons do not take these specificities into account.

The need to analyze regional competitiveness, rather than nationwide competitiveness, has been recognized before, mostly due to the increased attention given to regions as key in the organization and governance of economic growth and the creation of wealth. For example, in 2004 *Regional Studies*[2] published a special issue on the competitiveness of regions. The literature has used many concepts of competitiveness, for instance, Sala-i-Martin (2010) defines competitiveness as *the set of institutions, policies, and factors that determine the productivity of a country*. And the level of productivity, in turn sets the sustainable level of prosperity that can be earned in an economy. Hence, the global competitiveness index computed each year by the World Economic Forum constructs a composite indicator summarizing twelve different groups of indicators that are assumed to contribute to economic prosperity of nations. These indicators range from capturing the institutional environment or social capital to labor market efficiency and innovation indicators.

The concept that we will use in the present paper, will not engage in measuring different potential drivers of productivity (with the risk of omitting some), but will directly capture the productivity level of firms that are active in a particular region. Thus, the concept we use is the same as the one used by the European Commission in its Competitiveness Report[3]. Our approach has a number of advantages compared to earlier work that measures competitiveness of regions or nations. In particular, we start from analyzing *firm level* data, rather than an aggregate regional measure of productivity. This is important as there exists substantial heterogeneity between firms even within narrowly defined regions. Firms may differ in size, sectoral composition and technology used. Certain regions may attract certain type of firms that want to benefit from, for instance, supplier linkages or knowledge spillovers[4]. This allows us to engage in comparative analysis of competitiveness across regions, but after taking into account region specific characteristics. This may be important when analyzing the competitiveness of capital regions, like Brussels. By using firm level micro data we are also able to analyze the dependence of regions on a few large firms, which reveals potential vulnerability in terms of relocation threats.

The next section introduces the data, concepts and summary statistics. Section 3 tunes in on analyzing regional competitiveness and its evolution in the regions we study. Section 4 provides a number of final remarks.

---

[1] For an excellent overview of the theoretical models see Combes, Mayer and Thisse (2008).
[2] Regional Studies, Vol. 38 (9), 2004.
[3] European Competitiveness Report (2009), European Commission, DG Enterprise and Industry.
[4] See Rosenthal and Strange (2004) for a detailed discussion of such agglomeration forces.

1. Data and Definitions

The data are derived from EU company accounts, commercialized under the name "Amadeus" by Bureau Van Dijk (BvD). In recent years, this type of data has been used to analyze various economic issues in a growing number of academic and applied studies[5]. The coverage in the data set can vary between countries depending on the local legal requirements to file company accounts and the reporting requirements. We retrieve financial and operational information for the years 2005 and 2008. We considered all medium and large sized companies[6] for which unconsolidated accounts were available. Apart from financial and operational information also information on the sector in which the firm is active and the region and the city where the firm is incorporated is available. Since we use unconsolidated accounts this means that we also capture various affiliates of the same firm, even if these affiliates are located in different regions. As long as the affiliates are also incorporated and thus are required to submit unconsolidated company accounts we can trace the multi-region nature of a firm. Of course, firms with affiliates or plants in different regions that have no separate identity are not captured as they do not report separate accounts. It is the financial statement of the headquarter that matters in this case. While there are surely a number of observations in the data that can be classified into this latter category, it is likely going to be a small number. For Belgium, according to Haelterman (2010) this would be relevant for about 2% of the firms[7].

Table 1 provides an overview of the regions, the number of firms, either active in manufacturing or in services, and the total employment that we cover. Due to differences in the accounting legislation between Belgium and Germany, not all German companies report full company accounts and therefore our sample includes less German companies. When we compute regional competitiveness we will take this into account. We include 16 German regions and 3 comparable Belgian regions. These regions coincide with administrative and political regions.

---

[5] Konings et al. (2001) study price-cost margins in Belgian and Dutch firms, Budd et al (2005) analyze international rent-sharing in European multinational firms, Checchi et al (2003) investigate how labor demand adjusts in foreign versus domestic European firms.

[6] We focus only on medium and large sized companies in order to enhance the comparability between firms as the micro and small firms do not submit full company accounts in Germany.

[7] A.Haelterman, "The Feasibility to Regionalise Corporate Income Taxation", VIVES Discussion Paper 13, 2010.

Table 1: Overview Regions in 2008

Region	Number of firms	Total employment
Baden-Württemberg	3862	702624
Bayern	4061	758298
Berlin	793	155571
Brandenburg	593	82495
Bremen	314	65527
Brussels	11526	378086
Flanders	66579	1050638
Hamburg	763	157957
Hessen	2037	493214
Mecklenburg-Vorpommern	433	54697
Niedersachsen	2280	388771
Nordrhein-Westfalen	6257	1123506
Rheinland-Pfalz	982	191865
Saarland	347	60771
Sachsen	1609	184837
Sachsen-Anhalt	775	97011
Schleswig-Holstein	820	135615
Thüringen	774	99892
Wallonia	26895	374373
Total	*131700*	*6555748*

Source: authors' calculations based on Amadeus.

Since competitiveness is about measuring productivity we start by computing labor productivity, i.e. value added per worker. We then compare the average labor cost with the average labor productivity to obtain a measure of labor costs per unit of output, which is our measure of competitiveness. This is a sensible measure as it relates the value added that a typical worker produces with the cost of such a worker. If in one particular region the cost relative to the value added is higher than it is considered to be less competitive.

2. Regional Competitiveness differences

3.1 Measuring Regional competitiveness using Firm Level Data

Rather than computing the total value added and total wage bill for each region so as to create an aggregate regional indicator of competitiveness, as it is usually done in official statistics, we follow a slightly different approach in order to take into account a number of important elements. In particular, different regions may be characterized by a different sectoral composition, reflecting differences in sunk costs, technologies and capital intensities. Second, different regions may be characterized by different types of firms in terms of size. This could be related to sampling, historical factors or more general to the dynamics of agglomeration economies. Simply aggregating over all firms, without taking these specificities into account, would ignore these region fixed characteristics.

We therefore first estimate the following regression, where we apply importance weights as specified in STATA, to end up with a comparable regional aggregate measure of competitiveness.

$$comp_{it}^r = \alpha + \beta SIZE + \gamma SECTOR + \delta YEAR + \phi region + \varepsilon_{it}^r$$

Where subscript i stands for firm i, t is a time subscript and r stands for region, comp in the above equation captures the labor cost per output in a typical firm. We control for SIZE, which is a vector of firm size dummies, sector represents 2-digit sector dummies, YEAR stands for year dummies and region is a vector of regional dummies. It is these regional dummies that will give an indication of whether there are any persistent differences in regional competitiveness, after controlling for specific characteristics related to the firm and sector to which a firm belongs in a particular region. The graphs that we report below present the percentage difference in competitiveness of the different regions with respect to Flanders.

We notice from the results in Figure 1 that Wallonia and Brussels in particular stand at the top of the distribution, displaying a lag in competitiveness relative to Flanders of about 2 to 3 %. Perhaps surprisingly, Baden Wuerttemberg and Bayern, two relatively rich regions, perform not very good either, relative to Flanders they are about 3% less competitive. At the opposite side of the distribution, we highlight that Thueringen, Sachsen, Brandenburg and Sachsen-Anhalt perform better than Flanders (and all other regions) by 3 to 5%. It is interesting to notice here the geographical distribution of the best (respectively, worst) competitors of Flanders. The more advanced, relatively rich regions in Germany perform relatively worse, while emerging German regions, most of them located in Eastern Germany, seem to do relatively well[8]. It is striking that also in terms of the regional innovation scoreboard (2009) the East German regions score among the better regions both in terms of innovation and in terms of

---

[8] We refer to Berlin, Brandenburg, Thueringen, Sachsen, Sachsen-Anhalt and Mecklenburg-Vorpommern as Eastern German regions. They are coloured in orange in the graphs.

enabling innovation and are ranked as medium to high performers. Anecdotal evidence also seems to support our claim: a cluster of high tech firms in renewable energies ("Solar Valley") and optical service ("Optical Valley") has been developing in Eastern Germany, adding to the regions' structural skill shortage.[9] In contrast, regions like Bayern score also medium to high in terms of overall innovation performance, but in terms of enabling factors that can foster new innovation they score between average to medium-low.

*Figure 1: Cost per unit of output (competitiveness) – pooled sample 2005 -2008*
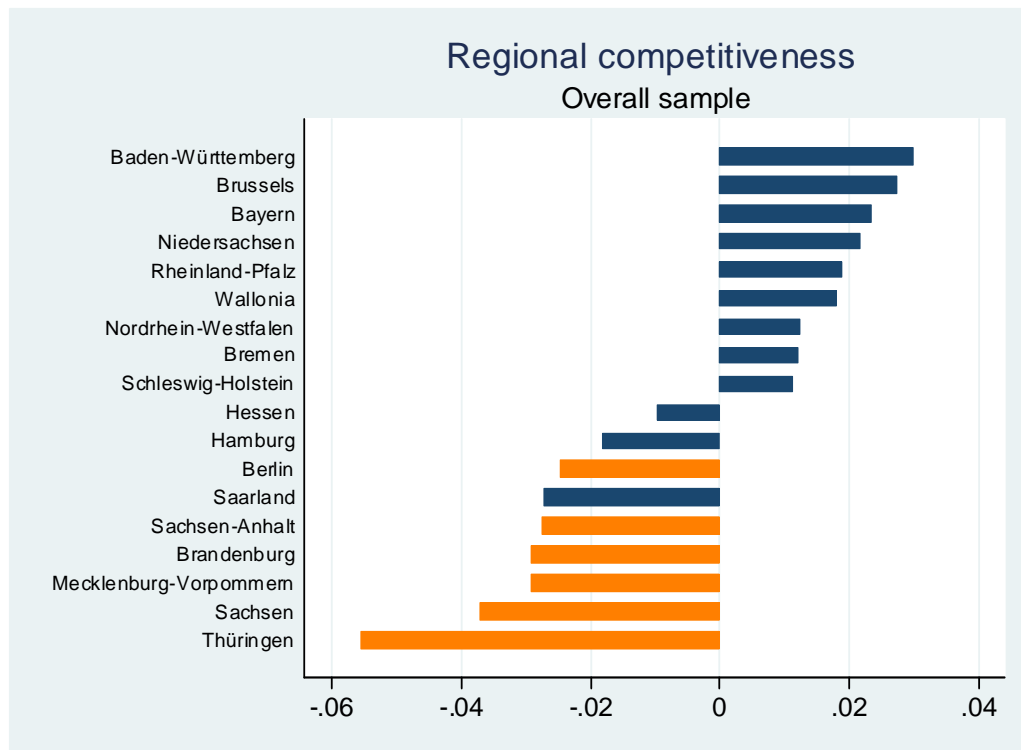
These results are substantially reflected in Figure 2, where we distinguish regional performance in services and manufacturing. While moving to Thueringen, a Flemish firm could gain up to 5.5% in competitiveness, while the advantage is somewhat reduced (2.5%), but still relevant, if it goes to Brandenburg, Sachsen-Anhalt. Brussels's lag in competitiveness with respect to Flanders seems to be driven by services, in which the disadvantage is much more remarkable. Manufacturing in the two regions appears on the contrary to be similarly competitive. The same can be said of Wallonia, but not for German regions. Manufacturing in German regions which are outperformed by Flanders seems to determine their disadvantage, while services are as competitive as the Flemish ones if not more, at least

---

[9] Business Week: *East Germany 20 years after the Reunification*, 5 November 2009 , and Der Spiegel International: *Eastern Germany confronts skilled labor shortage* 18 November 2010

for Schleswig Holstein and Nordrhein Westfalen. Hessen's surprising divergence in performance of services and manufacturing with respect to Flanders may be due to the concentration of advanced services in Frankfurt, which is located in the region. This result also makes Hessen more competitive than Flanders as a whole (ref. Figure 1). Services also appear to drive Berlin's relative performance with respect to Flanders. The contrary can be stated of the most competitive regions in our sample. Brandenburg, Sachsen-Anhalt and Sachsen display minor gains in competitiveness with respect to Flanders when only services are taken into account, while the relative performance of the manufacturing sector is impressive, with 6-7% gains in competitiveness with respect to Flanders. . Adding the time dimension to our analysis (figure not reported) we can add that these regions are increasing their competitiveness faster than Flanders, too, in both services and manufacturing, but especially in the latter branches. Also Saarland, historically a heavily industrial region, seems to be much more competitive than our benchmark as far as the manufacturing sector is concerned, while underperforming in services.

The fact that in terms of manufacturing relatively rich regions like Bayern or Baden-Württenberg perform worse than the East German Länder, suggests that Germany is turning in what Hans-Werner Sinn called a Bazar Economy. East Germany in that view is turning into the manufacturing and assembly region, while West Germany is developing further in services. Whether this trend is materializing, however, needs a more detailed analyzes of the dynamic process of industry evolution and falls beyond the scope of the present paper.

*Figure 2: Cost per unit of output for services and manufacturing*
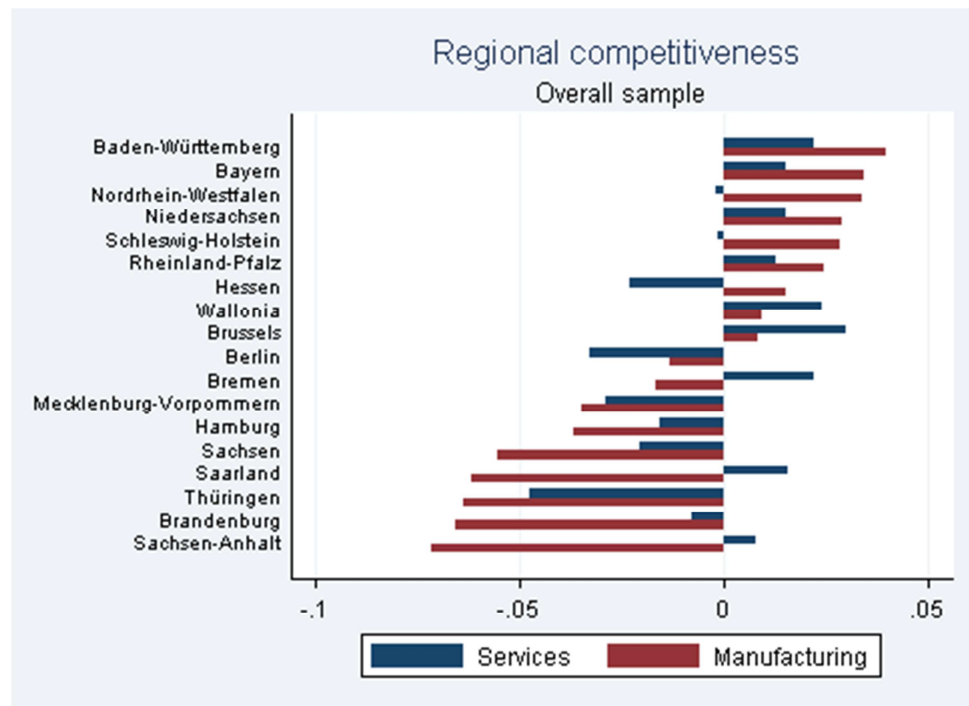
Please notice that the regions are ranked in terms of relative competitiveness of manufacturing

Further concentrating on the time dimension (figure not reported), we find out that Rheinland-Pfalz, Nordrhein-Westfalen, Bayern and Baden-Wuerttemberg, despite performing worse than Flanders, have considerably improved their relative performance from 2005 to 2008. Among the top regions, further remarkable progress has been achieved by Mecklenburg-Vorpommern, Saarland, Brandenburg and Berlin. No region, on the other hand, inverted its position relative to Flanders from 2005 to 2008, except for Schleswig Holstein, which from very uncompetitive finds itself more competitive than Flanders in 2008, although by less than 1%. Brussels, Wallonia and Hamburg, on the contrary, became less competitive in 2008 than they were in 2005, always in relative terms.

3.2 The role of labor costs

The divergences in competitiveness between seemingly similar regions, at least as far as access to technology is concerned, begs the question why these differences are often persistent. One explanation is that the degree of product and market regulation may trigger differences in pricing behavior and in particular in the wage determination process. We perform the same regression as in paragraph 3.2 for log- labor productivity and log - unit labor costs and thus we look at residual labor costs differences after taking into account differences in regional sectoral composition and average firm size. By doing this we capture more closely the institutional features of particular regions as well as the attractiveness of regions in terms of labor costs and productivity, which could be triggered for instance by agglomeration economies. The results are shown in Figure 3 and Figure 4. In the first figure Flanders is normalized to 1, in the other to 0.

Figure 3: firm-level cost of production per employee (unit labor cost) – pooled sample
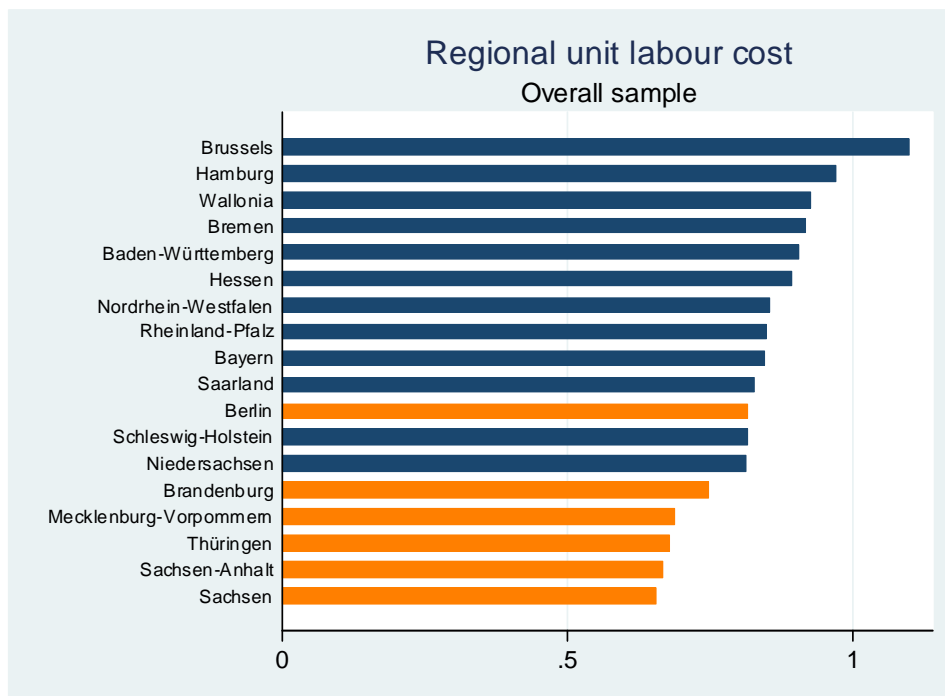
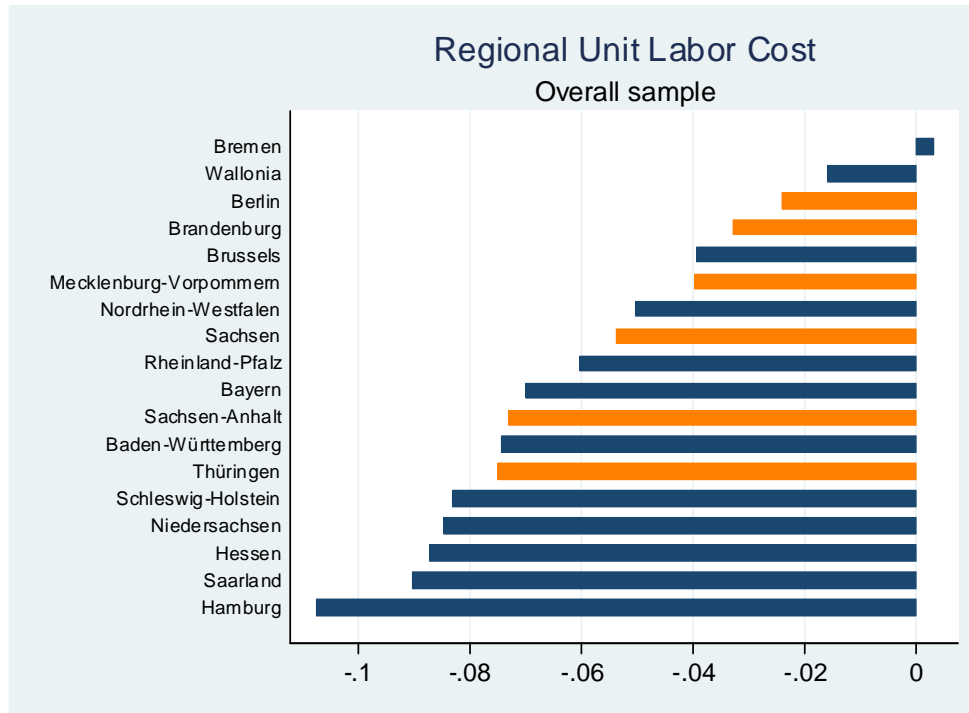**Figure 4: Relative Growth in labor costs between 2005-2008**

Figure 3 confirms that labor costs are higher in Belgian regions than in German ones (with the exception of Hamburg), so that Flanders has among the highest labor cost per worker, with only Brussels exceeding that of Flanders on average. Wallonia follows closely, with approximately 93% the unit cost of Flanders. In other words, while moving from Flanders to Wallonia a firm would save about 7% in its unit labor costs. The *Eastern German* regions have unit costs that barely reach 70% of the Flemish ones, with the exception of Berlin, which has higher labor costs, yet still substantially lower on average than in Flanders and Wallonia. This is the result of an average reduction in unit labor costs across all regions from 2005 to 2008 with respect to Flanders and can be caused by a number of factors, including a continued policy of wage moderation and an increase in working time without extra compensation. The results we show in Figure 3 also reflect adjusted wage comparisons. In other words, controlling for differences in firm size and differences in sectoral composition we analyze whether there exists a residual variation in wages. Figure 4 shows the relative growth rate in labor costs between 2005 and 2008, where again the horizontal axes shows the percentage growth difference relative to Flanders. Except for Bremen, all other regions have experienced a more moderate wage growth rate than Flanders. When distinguishing manufacturing and services companies, we highlight that wages in services do not only grow less in all regions than in Flanders, but also less than manufacturing wages.

The relative high labor costs of Brussels and Hamburg with respect to Flanders indeed is reflected in higher productivity, as shown in Figure 5, where Flanders is benchmarked at 1. In particular, the two

cities perform as well as Flanders, while all other regions in our sample do worse. Despite the fact that labor cost differences are reflected to a certain extend in productivity differences, it seems to be the case that the gap in productivity is more than compensated by labor costs in the most competitive regions. Comparing Figure 3 with Figure 5 it is clear that the wage gap is larger than the productivity gap. This is also reflected when we compare Figure 4 with Figure 6, the latter showing the growth rate in relative productivity between 2005 and 2008, with Flanders benchmarked at 0. The relative slower growth rate in labor costs seems to be larger in magnitude than the slower growth rate in productivity relative to Flanders. In other words, the discount in growth of labor costs with respect to Flanders is greater than the penalization of these regions in productivity growth with respect to the benchmark. It is perhaps interesting to notice that regions which are often considered comparable to Flanders in terms of development and innovation capacity such as Bayern and Baden-Wuerttemberg suffer of a 10-15% gap in productivity with Flanders. This is consistent with what reported in the Flanders Outlook 2010, where Flanders ranks third out of 16 considered regions, resulting less productive than South and West Netherlands only. Baden Wuerttemberg and Bayern lag behind by 5 to 8% in terms of labor productivity.

Figure 5: firm-level value added per employee (productivity) – pooled sample

Figure 6: Relative growth in productivity 2005-2008
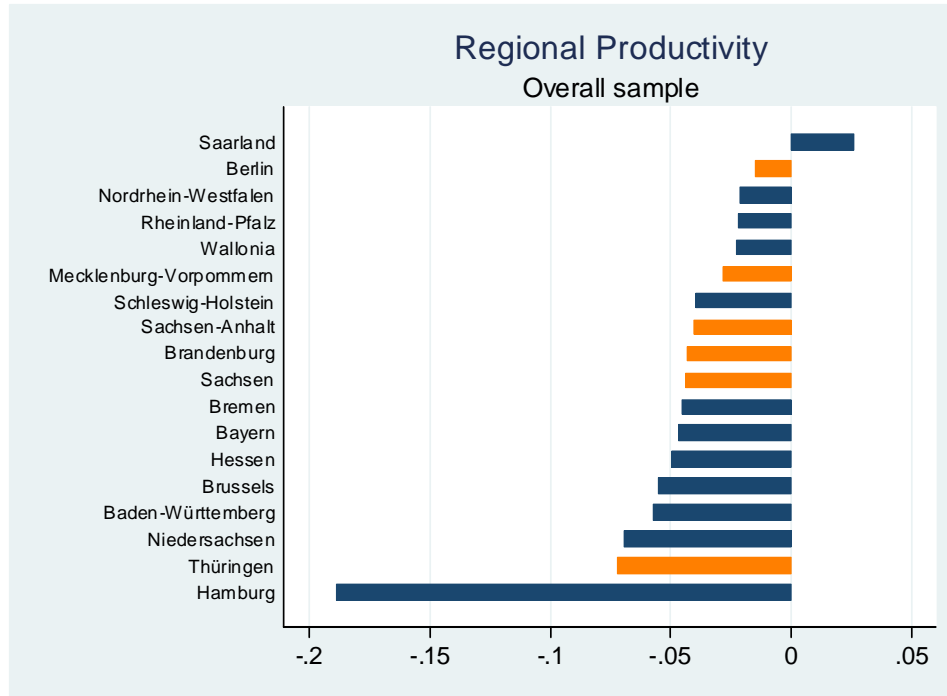
3. Conclusion

The main objective of this paper has been to analyze competitiveness at the regional level. We chose this focus in view of the relevance of regional characteristics for the location choice and growth potential of firms. We focused on analyzing two federal countries, Belgium and Germany, the former characterized by rigid labor markets, while the latter having gone through a substantial transformation after the Harz reforms. Our reference point has been Flanders because Flanders has been ranked among the top regions in terms of innovation according to the regional innovation score board of the European Commission.

We find that immediate neighbors to Flanders, are less productive and have lower labor costs. However, the gap in labor costs is not sufficiently large to compensate for the lower productivity. As a result, Flanders emerges as more competitive than "obvious" candidates for comparison such as Nordrhein-Westfalen, Bayern, Baden-Wuerttember. Furthermore, Flanders also outperforms its (geographically) closest competitors, Brussels and Wallonia. Interestingly, Eastern German regions, on the contrary, are among the most competitive and are found to be 3 to 5 % more competitive than Flanders. This is mainly driven by a much better performance of the manufacturing sector. In contrast, places like Berlin and Hessen (including Frankfurt) do very well in terms of their service industry, which suggests that West German regions are increasingly turning into a service economy, while East German regions are building up a comparative advantage in manufacturing.

References

Budd, J. W., Konings, J. & Slaughter, M. J. (2005), "Wages and international rent sharing in Multinational firms", Review of Economics and Statistics

Checchi, D., G, Navaretti, and A, Turrini, 2003. "Adjusting Labour Demand: Multinational versus National Firms - A Cross-European Analysis." Centre for Economic Policy Research, DP 3751

Combes, P.P., Mayer, T. and Thisse, J.F. 2008. "Economic geography: The integration of regions and nations" Princeton University Press.

European Commission, DG Enterprise and Industry, 2009 "European Competitiveness Report 2009"

Haelterman, A. 2010. "The Feasibility to Regionalise Corporate Income Taxation", VIVES Discussion Paper 13.

Konings, J., Van Cayseele, P. and Warzynski, F., 2001. "The Dynamics of Industrial Mark-ups in two Small Open Economies: Does National Competition Policy Matter?". International Journal of Industrial Organization

Reinhart, C.M. and Rogoff,K.S. 2010. "Growth in a Time of Debt," American Economic Review

Rosenthal, S.S. and Strange,W.C. 2003. "Geography, Industrial Organization, and Agglomeration," The Review of Economics and Statistics

Regional Innovation Scoreboard (2009). http://www.proinno-europe.eu/page/regional-innovation-scoreboard.

Sala-i-Martin, X. (2010). "The Economics behind the World Economic Forum's Global Competitiveness Index", in ed. Paul De Grauwe (2010). *Dimensions of Competitiveness*, MIT Press, pp. 1-19.