ETLA Muistio | Brief | 68 25.6.2018

Regional economic disparities in Finland

Paolo Fornaro
The Research Institute of the Finnish Economy
paolo.fornaro@etla.fi

Suggested citation:
Fornaro, Paolo (25.6.2018).
"Regional economic disparities in Finland".

ETLA Brief No 68.
https://pub.etla.fi/ETLA-Muistio-Brief-68.pdf

Abstract

In this note, I study the Finnish regional dispersion of economic indicators such as the GDP per capita, labour productivity, the employment rate and the compensation of employees. Moreover, I examine the regional-level correlation between these variables. The results are then compared with what has been found for the German and Italian economies.

Finnish regional economies display substantial variation, but their GDP per capita, productivity and employment rate have converged. However, the compensation of employees has diverged. Compared to Germany and Italy, the Finnish economy has a lower regional dispersion, with a similar convergence process as in Germany. The correlation between regional productivity and the employment rate is lower than what is found in Italy and Germany, and the same holds for productivity and wages.

The picture gathered from this analysis is mixed. Convergence of economic conditions is certainly positive, but the divergence of the compensation of employees can be problematic for the long-term sustainability of the Finnish regional markets. If well-paid jobs concentrate in richer regions, there will be higher incentives for young and well-educated workers to move away from peripheral (in economic terms) areas, which would be at risk of stagnation.

Tiivistelmä

Alueelliset erot Suomessa

Tässä muistiossa tarkastellaan, millaista alueellista vaihtelua Suomessa on esiintynyt bkt:n suhteessa asukasta kohti, työn tuottavuudessa, työllisyysasteessa ja palkoissa. Lisäksi tutkitaan sitä, miten nämä tekijät ovat korreloituneet keskenään. Suomen kehitystä myös verrataan Saksaan ja Italiaan.

Suomen maakuntien väliset erot ovat olleet monessa suhteessa suuret, mutta erot ovat kaventuneet merkittävästi. Variaatiokertoimella mitattuna bkt per asukas, työn tuottavuus ja työllisyysaste vaihtelivat maakuntien välillä vähemmän vuonna 2015 kuin vuonna 2000. Sen sijaan palkkojen vaihtelu on kasvanut. Suomen alueelliset erot ovat pienemmät kuin Saksassa ja Italiassa. Suomen alue-erojen kaventuminen on ollut samanlaista kuin Saksassa. Tuottavuuden ja työllisyysasteen välinen korrelaatio Suomen maakunnissa on ollut pienempi kuin Saksassa ja Italiassa.

Tulokset tarjoavat kiinnostavan kuvan Suomen aluekehityksestä. Elintason, työn tuottavuuden ja työllisyyden erojen kaventumista voidaan pitää myönteisenä. Sen sijaan palkkatasojen erkaantuminen voi lopulta aiheuttaa ongelmia. Jos korkeapalkkaiset työpaikat keskittyvät harvoille vauraille alueille, tämä voi kannustaa nuoria ja korkeasti koulutettuja lähtemään köyhemmistä maakunnista. Tämä saattaa jähmettää köyhempien kuntien kehityksen.

This brief is based on research conducted within the Tacking Biases and Bubbles in Participation (BIBU) project. The author is grateful for the funding provided by the Strategisen tutkimuksen neuvosto (STN).

Tämä muistio perustuu tutkimukseen, joka on osa kansalaisuuden kuilut ja kuplat -tutkimushankkeesta (BIBU). Kiitään Strategisen tutkimuksen neuvostoa (STN) tutkimuksen rahoituksesta.

Key words: Convergence, regional inequalities, productivity, wages

Avainsanat: Lähentyminen, alueellinen eriarvoisuus, tuottavuus, palkat

JEL: O47, R11, R23

Introduction

Regional economic inequalities have been widely discussed during the years following the financial crisis, especially at the European level. There are multiple reasons why this topic has been at the centre of the public debate. First of all, economic differences among Member States and within individual nations can have a strong impact on the EU economic governance (Gros et al., 2017). Moreover, economic inequalities can also have important consequences on the socio-political landscape of a country (on this topic see, for example, Piketty, 2018).

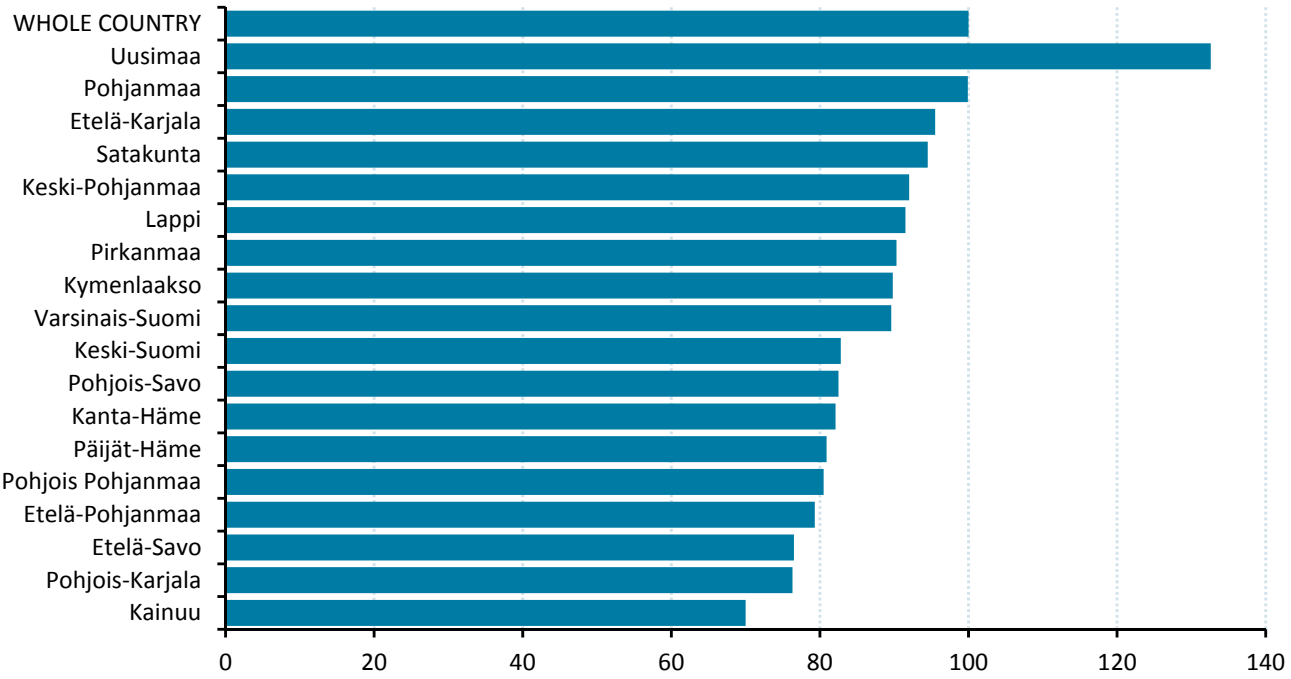
Long-term shifts in the economic structure, e.g. the increasing automation of low-skilled tasks in manufacturing processes (see the discussion in Bubbico and Freytag, 2018) and the creation of new jobs related to technological advances, have favoured large urban areas and damaged industrial hubs (Iammarino et al., 2017). In addition, regional endemic factors have affected the capacity of different areas to take advantage of new economic trends.

During the last 10 years, Finland has been hit by shocks with heterogeneous impacts on different areas. One can think of the crisis of the pulp and paper industry (data from the Finnish Forest Industries Federation indicate a roughly 25 percent drop in paper and pulp production from 2008 to 2017), or the closure of the Nokia plant in Salo in 2012. Aside from sparse anecdotal evidence, it is interesting to examine the dynamics of economic (in)equality among Finnish regions. This note addresses this issue by analysing the Finnish regional differences in GDP per capita, labour productivity, employment and wages, and how these have changed between 2000 and 2015, with a special focus on inter-regional dispersion (the so-called sigma-convergence).

Regional inequalities and their dynamics

I start the analysis by looking at how Finnish regions' GDP per capita for 2015 compares to the EU15[1] average, in purchasing power standard (PPS). A number below

Figure 1 Regional GDP per capita for 2015, in PPS where the EU15 values is 100



Source: Statistics Finland and author's own calculations.

100 indicates that the regional GDP per capita is lower than the average of the EU15 countries and vice versa for values above 100.

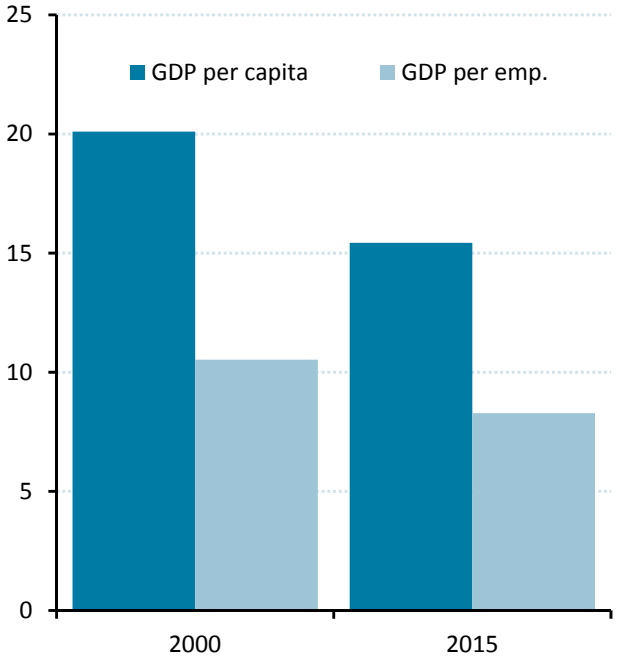
The picture we get from Figure 1 is mixed. The 2015 GDP per capita of Uusimaa is 30% larger than the EU15 average, while the one of Kainuu is 30% lower than the EU15 level. Apart from these two extremes, the GDP per capita among regions is fairly uniform.

GDP per capita can be separated in two main components, labour productivity and the employment rate, formally:

$$GDP\ pc = \frac{GDP}{Emp}\frac{Emp}{Pop}$$

where *Emp* denotes the number of employed persons. As pointed out in Gros, Musmeci and Pilati (2017), the regional dispersion of GDP and the one of productivity, in EU countries, follow different patterns. I verify this aspect by looking at the coefficient of variation (i.e. the standard deviation among regions divided by the national average) for regional GDP per capita and GDP per employee (i.e. labour productivity), for 2015 and 2000.

Figure 2 **Regional variability (coefficient of variation) for GDP per capita and labour productivity**



Source: Statistics Finland and author's own calculations.

Figure 2 gives three major insights. Firstly, labour productivity dispersion across regions (measured by the coefficient of variation of GDP per employed person) is significantly lower than the one of GDP per capita. The second aspect worth noting is that both coefficients of variation of have dropped substantially over the years 2000–2015, indicating a sigma-convergence for these two measures. Finally, the drop in the regional variability is substantially equal for both GDP per capita and per employed persons.

Next, I report the values for the coefficients of variation of GDP per capita, GDP per employed person, compensation of employees (per employee) and the employment rate (measured as the total number of employed persons divided by the total population), together with their percentage changes between 2000 and 2015.

The results of Table 1 point toward a strong regional convergence of the GDP per capita, GDP per employee and the employment rate, with the latter showing an even stronger convergence compared to the other two. One possible explanation behind this convergence is related to the internal migration toward richer regions. The correlation between the average net migration rate (at the regional-level) over the years 2000–2015, and the employment rate in 2000 is more than 0,4 (0,3 correlation with GDP per capita in 2000). In other words, richer regions have experienced a strongly positive net flow of population from other regions. Another driving factor behind the convergence of the employment rate is the different age structure characterizing Finnish regions. The share of the population between 55 and 69 years old is significantly larger in peripheral regions like Kainuu (21 percent) compared to Uusimaa (17 percent). The correlation between the share of population above 60 (computed over the years 2000 and 2015) and the change in the employment rate between 2015 and 2000 is 0,27, indicating that the regional age structure has also played a significant role in the employment rate convergence.

Compensation of employees, while showing the lowest regional variation among the indicators examined, displays a divergent pattern. This fact might indicate that richer regions, like Uusimaa, have experienced a larger

Table 1 **Regional variability (coefficient of variation) for GDP per capita, GDP per employed persons, employment rate and compensation of employees, in 2000 and 2015. Results are in percentage.**

	GDP per capita	GDP per emp.	Emp. rate	Salary per emp.
2000	20,1	10,5	13,3	5,7
2015	15,4	8,3	9,0	7,4
Percent. Diff	-23,2	-21,3	-32,3	29,3

Source: Statistics Finland and author's own calculations.

increase in well-compensated jobs, possibly linked to the development of new technologies and the growth of related industries. At the same time, regions which were lagging behind in 2000 have seen a disproportionate increase of their GDP and of the employment rate, where inter-regional mobility can play a stronger role. These considerations highlight the importance of viewing the convergence vs. divergence discussion from both the production (measured by GDP) and income side. The compensation of employees used in this analysis is measured using the location of the households, implying that it can be considered a better measure of the actual economic conditions of the residents of a region. One would optimally use indicators like the Gross National Income at the regional level, but unfortunately it is not available.

The interplay between employment and productivity

In addition to analysing regional employment and production on their own, it is interesting to see how the indicators examined so far are related. This kind of exercise can shed light on whether more productive regions have a higher employment rate and more well-paid jobs. Firstly, I compute the correlation coefficients between the variables considered in this study, for both the year 2000 and 2015, and report them in Table 2.

Table 2 **Correlation coefficients for regional indicators, years 2000 and 2015**

	GDP per capita	GDP per emp.	Emp. rate	Compensation of emp.
2000				
GDP per cap	1,00	0,75	0,88	0,88
GDP per emp	–	1,00	0,35	0,80
Emp. rate	–	–	1,00	0,69
Compensation of emp.	–	–	–	1,00
2015				
GDP per cap	1,00	0,81	0,87	0,78
GDP per emp	–	1,00	0,43	0,86
Emp. rate	–	–	1,00	0,48
Compensation of emp.	–	–	–	1,00

Source: Statistics Finland and author's own calculations.

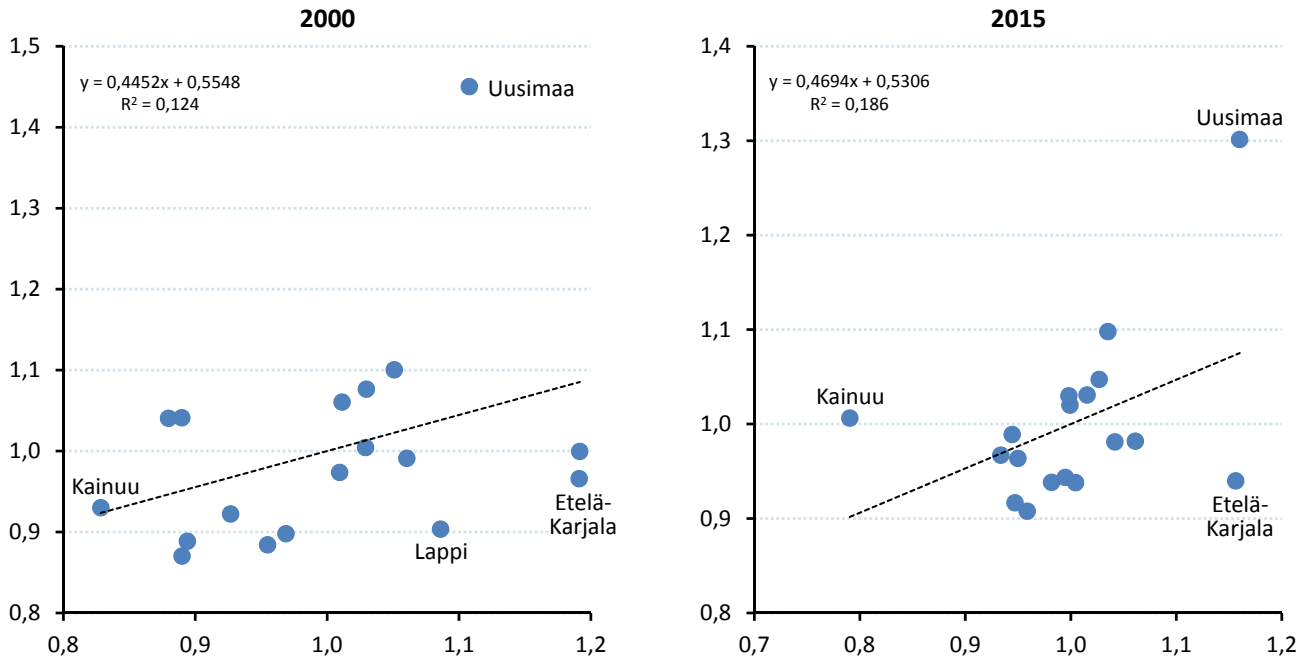
The correlation between regional GDP per capita and productivity is strong, both for the year 2000 (r=0,75) and 2015 (r= 0,81). The same goes for the GDP per employee and the compensation of employees (r=0,80 in 2000 and r=0,86 in 2015). However, this result is strongly affected by the presence of Uusimaa and Kainuu; once we remove these two regions the correlation between and productivity and compensation of employees drops (from 0,76 in 2000 to 0,61 in 2015). I find other two somewhat surprising results. Firstly, the correlation between regional productivity and the employment rate is fairly weak (r=0,35 in 2000 and r=0,43 in 2015), especially compared to other European countries (I discuss this point in Section 4). The other surprising finding we can draw from Table 2 is that the correlation between the regional employment rate and the compensation of employees has dropped substantially during the last 15 years (from r=0,69 to r=0,48).

To finish the report, I depict the scatter plots of the regional GDP per worker, against the regional employment rate and compensation per employee. All variables are represented relative to the national average.

The fact that the relation between regional productivity and the employment rate is less than 1 to 1 and the very low R^2 goes in accordance with the low correlation coefficients reported in Table 3, and it indicates that regions with higher productivity tend to have higher employment rates, but this relationship is weak. Uusimaa and Etelä Karjala display very similar GDP per employed person (in 2000, Etelä Karjala had a larger GDP per employee) value, but the former has a substantially larger employment rate. At the other end of the spectrum, we have Kainuu, the region with the lowest GDP per employees. Interestingly, looking at 2015 data, Kainuu's employment rate is above the regression line, indicating that its employment rate is above what its regional productivity level would imply. Finally, I depict similar scatter plots for GDP per employee and wages per employed person.

Figure 4 gives us two important indications. The relationship between regional productivity and the compensation of workers is stronger than the one between productivity and the employment rate, even though the ability of GDP per employee to explain regional variability in wages is lower than the one found for Italy and Germa-

Figure 3 **Regional GDP per employee (X-axis) and employment rate (Y-axis), relative to the national average**



Source: Statistics Finland and author's own calculations.

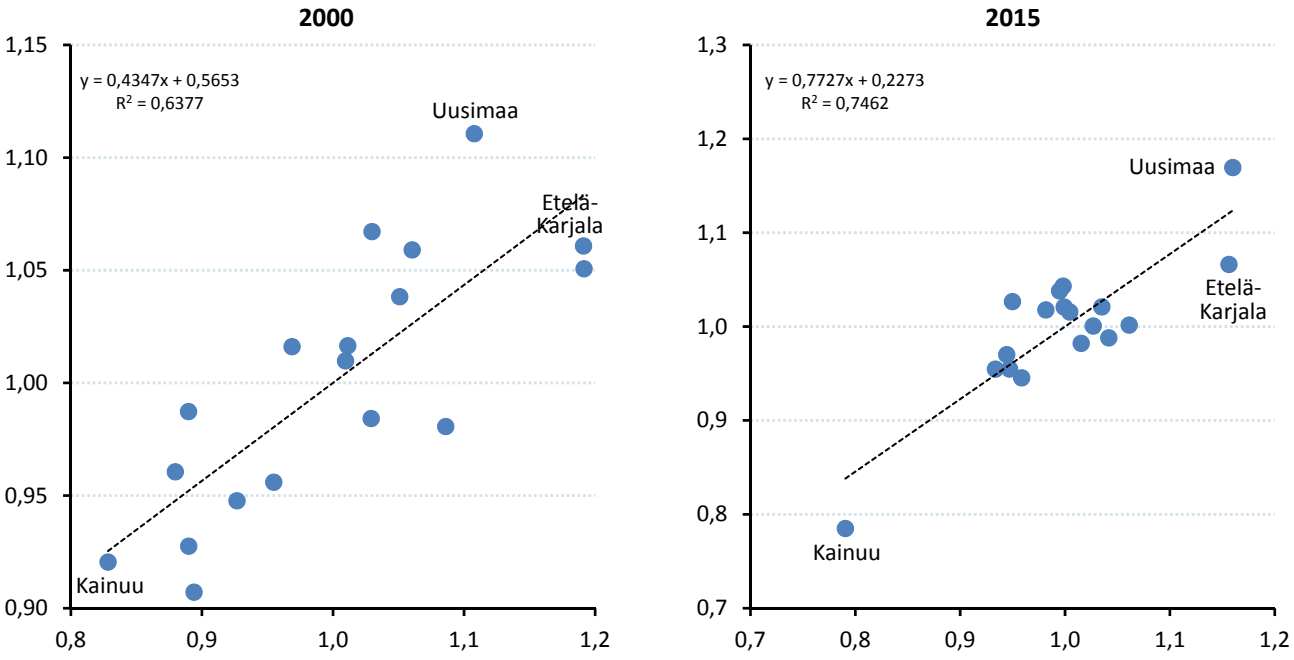
ny (see Gros et al., 2017), especially looking at data for year 2000. In general, we would expect that the relationship between productivity and employees' compensation would be close to 1 to 1. Intuitively, entrepreneurs should, over the long run, pay their employees in accordance with their productivity, hiring when wages are lower than the productivity of employees and cutting jobs in the opposite scenario.

The other aspect worth noting is the increase in the ability of productivity to explain the variation in compensation of employees. In other words, in 2015 the productivity of a region was more strongly related to the salaries of that region, compared to 2000. Looking at some specific regions, Uusimaa displays the largest average salary, both in 2000 and 2015, and Kainuu has the lowest wages per employed person. On the other hand, Etelä Karjala has one of the highest productivity level, but its compensation of employees per worker is lower than what its productivity implies. The tighter relationship between employees' compensation and labour productivity might signal a more flexible labour market, where firms are more able to pay their employees in accordance with their productivity level. However, it is important to notice that Uusimaa and Kainuu have a strong influence on the results in Figure 4, especially for 2015. Once we remove these two regions, the beta coefficients are very similar (0,38 for both 2000 and 2015).

A short comparison with other EU countries

Even though the focus of this study is the Finnish economy, it is interesting to see how the inter-regional variation in Finland compares to other European countries. In this short discussion, I consider Italy and Germany as comparison, and use the values reported in Gros et al. (2017). A word of caution before proceeding to the results: Finnish regions are smaller than most German and Italian ones (for example, Lombardy has almost double the population of Finland as a whole). The different regional size characterizing the three countries examined in this section can be slightly problematic for the inter-

Figure 4 **Regional GDP per employee (X-axis) and compensation of employee (Y-axis), relative to the national average**



Source: Statistics Finland and author's own calculations.

pretation of the level results (i.e. comparing the three countries for a given year), because of the inherently different economic structure of the regions (e.g., Finnish regions might have more specialized economics). However, this problem is not present when looking at changes over time, which is the focus of the analysis.

I start by reporting the coefficients of variation for Finland (years 2000 and 2015), Germany and Italy (2000 and 2014). The variables I consider are GDP per capita, GDP per worker and the employment ration (workers/population). Moreover, I report the correlation coefficient between the regional employment rate and GDP per employed person.

Table 3: Coefficients of variations for selected variables at the regional level: Finland (year 2000 and 2015), Germany and Italy (2000 and 2014).

The results in Table 3 provide us many points of discussion. Finland, among these countries, displays the lowest inter-regional dispersion for both GDP per capita and labour productivity. While the coefficient of variation for the employment rate is higher in 2000, compared to Germany, it became lower than the German one. Moreover, both Germany and Finland have experienced a substantial convergence for all three indicators examined. On the other hand, the Italian economy, despite being the most inequal in 2000, has diverged over time. Another interesting point is that the lower inter-regional variation of productivity, compared to the one of GDP per capita, is replicated in both Germany and Italy. One of the surprising facts we can gather from Table 3 is the low correlation between regional employment rate and productivity for Finland (0,35 and 0,43 for 2000 and 2015, respectively), compared to Germany (0,74 and 0,76) and Italy (0,80 and 0,92). These results are also reflected in the low R^2 of Figure 3 (roughly 0,2 in 2015), which is much lower than the one found for the Italian (0,85) and German (0,58) economies, in Gros et al. (2017). Related to this point, the relation between productivity and the workers' compensation is weaker in Finland (0,76 R^2 in 2015) than in Italy (0,91 R^2) and Germany (also 0,91 R^2). The weaker relationship between regional productivity and labour markets indicators (employment rates and wages) in the Finnish economy, compared to the German one for example, can be a very interesting topic for further research.

Conclusions

In this short note, I have examined how some important indicators of regional economic conditions have changed over time. Overall, I find a strong regional converge for crucial indicators such as the GDP per capita, the employment rate and labour productivity. This convergence can derive from both more efficient labour markets (although the increase over time of the correlation between productivity and compensation of employees is affected by Uu-

Table 3 **Coefficients of variations for selected variables at the regional level: Finland (year 2000 and 2015), Germany and Italy (2000 and 2014)**

	Coefficient of variation			Correlation
	GDP per capita	GDP per emp.	Emp. rate	Emp. rate – GDP per worker
FI 2000	20,1	10,5	13,3	0,35
FI 2015	15,4	8,3	9,0	0,43
DE 2000	24,1	16,9	10,0	0,74
DE 2014	21,5	13,5	9,4	0,76
IT 2000	28,3	12,1	17,0	0,80
IT 2014	28,8	12,8	16,6	0,92

Source: For Finnish results, Statistics Finland and author's own calculations. For results on Germany and Italy, Gros et al. (2017).

simaa and Kainuu), the migration toward richer regions and the different regional age structures.

On the other hand, it is important to highlight the divergence in the compensation of employees (per worker). This measure displays the lowest regional dispersion, compared to the other indicators examined in this report, but the relative increase in the coefficient of variation between 2000 and 2015 is remarkable. This might signal an underlying trend, where more and more well-paid jobs concentrate in the richer regions, like Uusimaa, which have been more capable to take advantage of the technological developments of the last 15 years. More peripheral regions, while catching up in terms of labour market conditions and overall production, might have concentrated on industries with less remunerative jobs.

The picture we gather from this analysis is mixed. Convergence (and general improvements) in labour market conditions is certainly positive and it can explain why Finland has been somewhat more resilient to the waves of populism and extremism that have characterized other European countries. On the other hand, the divergence of the compensation of employees can raise some questions over the long-term sustainability of the Finnish regional markets. If more and more well-paid jobs concentrate in the richer regions, there will be higher incentives for young and well-educated workers to move away from the more peripheral (in economic terms) areas, which would be at risk of stagnation.

Endnote

[1] EU15 countries are Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and the United Kingdom.

References

Bubbico, R. L. & Freytag, L. (2018). Inequality in Europe. European Investment Bank.

Gros, D., Musmeci, R. & Pilati, M. (2017). The European Dimension of Regional and Cohesion Policies. Laboratorio Luiss sul Mezzogiorno, 3.

Iammarino, S., Rodríguez-Pose, A. & Storper, M. (2017). Why Regional Development matters for Europe's Economic Future. European Commission, 07/2017.

Piketty, T. (2018). Brahim Left vs merchant Right: Rising Inequality & the Changing Structure of Political Conflict (Evidence from France, Britain and the US, 1948–2017). WID.world Working Paper Series, 2018/7.

Elinkeinoelämän tutkimuslaitos

The Research Institute of the Finnish Economy

ISSN-L 2323-2463
ISSN 2323-2463

Tel. +358-9-609 900
www.etla.fi
firstname.lastname@etla.fi

Arkadiankatu 23 B
FIN-00100 Helsinki