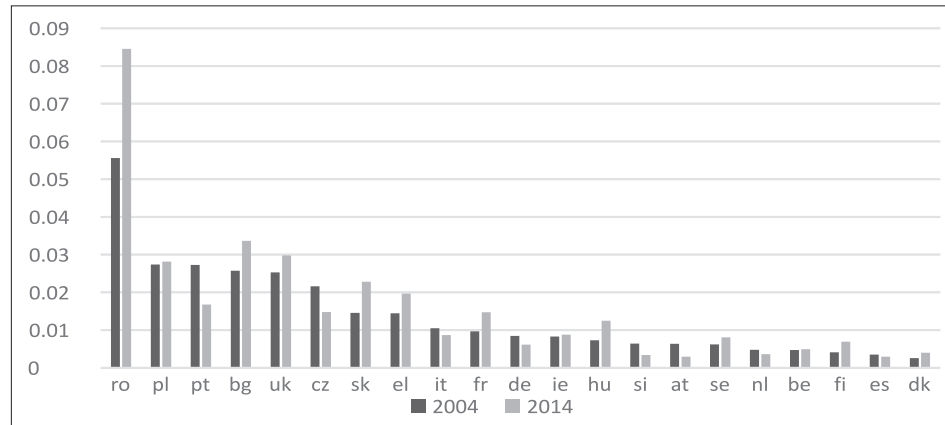


**Figure 15: Labour productivity differences within selected countries in 2004 and 2014**



## 6. Conclusions

Our research highlights the strong increase in economic activity accompanying each EU enlargement wave (with the exception of the EU-15 1995 enlargement). It is clear that the European Union nowadays is a much more fragmented, heterogeneous political and economic entity than it would have been, had it maintained the same Member State composition as in the 1990s. Nevertheless, we observe a decreasing trend in overall inequality following each EU enlargement phase, a trend that is not apparent for the core countries. This descending trend however cannot keep pace with the EU expansion process; convergence may be happening, but at a comparatively much slower speed and in many cases at the cost of rising inequality within countries.

Existing research generally points towards convergence on a between countries level, and increasing divergences between regions within countries. We verify this hypothesis and find this to be the case for core countries (EU-12 and EU-15), where within-country inequality is responsible for a higher share of total inequality than the between-country component. Nevertheless, differences between countries are also increasing, pushing total inequality upwards. We find this to be mainly driven by rising disparities in the employment rate. As regards subsequent EU enlargement waves, we find a reversed relationship, with disparities for total EU-25 and EU-27 inequality being mainly explained by the between-country component and large variations in productivity levels between countries.

In terms of regional inequality within countries, we find that on an aggregate level, employment effects are to a larger extent responsible for re-

gional disparities than productivity effects. This is the case both in core countries and in the actual EU composition of nowadays. Still, if we separately analyse the distribution of productivity within selected countries, we find startling increases in inequality, especially in Eastern Europe, suggesting that the catching-up process is spatially concentrated in selected regions with a high level of production activities, whereas the remaining regions are lagging behind.

As this paper is based on the ex-post analysis of a limited numbers of indicators, we cannot make a claim about what the causal relationship behind the development of inequalities is. Another caveat is the likely overestimation of income concentration in our analysis, as through commuting, some of the income gained in capital cities will benefit other regions as well. This problem is attenuated but not eliminated by using regions of a reasonably large size.

Overall, we can still draw differentiated policy implications from our results. We observe a dramatically increased importance of the employment component, particularly in core countries, and a reversal of the convergence process, whereas newer Member States are still defined by a descending trend in inequality and large productivity disparities. This suggests there is a need for separate policy-making, focussing on a more equal distribution of employment across regions in older Member States, as opposed to focussing on the productivity catching-up process in EU-27. If we further look at the distribution of production activities on a regional level, we verify the existence of so-called developmental hubs with a high share of GVA relative to the population share, which seem to exist in isolation from the rest of the country and show only limited trickle-down effects. These developments emphasise the increasing importance of regional policy, so as to prevent further urban-rural and regional polarisation in the future.

The discourse on the speeds of Europe must be more nuanced, since the implications for development often go beyond the level of the national state and need to take into account significantly different trends at the regional level. We must be aware that lived realities in the EU are extremely diverse and it is clear that this will shape the political agenda differently across Member States. It can be dangerous to use the speeds of Europe discourse to create a politically united and economically strong inner club that dictates the direction of EU development, since this group of countries faces different challenges than other Member States and thus runs the risk of excluding poorer countries/regions from actively shaping the policy-making process.

## Annex 1

### The Theil Index

The generic formula for the Theil index is given by:

$$T = \sum_{i=1}^n \left[ \frac{a_i}{A} \ln \left( \frac{\frac{a_i}{A}}{\frac{b_i}{B}} \right) \right]$$

$a_i$  and  $b_i$  being the value of some variable (e.g. GVA or population) for each group, and  $A$  and  $B$  representing the sum of the respective variables over all the groups.

Since in our case, we work with income and population shares most of the time, we use  $y_i$  to denote regional GVA and  $n_i$  for regional population.  $Y_c$  and  $N_c$  denote the total income or population in a country, while  $Y_{EU}$  and  $N_{EU}$  are the respective totals for the whole EU.

The following formulas apply:

$$T = T_{between} + T_{within}$$

$$T_{between} = \sum_{c=1}^{m_{countries}} \left[ \frac{Y_c}{Y_{EU}} \ln \frac{\frac{Y_c}{Y_{EU}}}{\frac{N_c}{N_{EU}}} \right]$$

$$T_{within} = \sum_{c=1}^{m_{countries}} \left[ \frac{Y_c}{Y_{EU}} T_{country} \right]$$

$$T_{country} = \sum_{i=1}^{m_{regions}} \left[ \frac{y_i}{Y_c} \ln \frac{\frac{y_i}{Y_c}}{\frac{n_i}{N_c}} \right]$$

We can also decompose the Theil index by splitting it into shares of productivity and employment:

$$\frac{y_i}{n_i} = \frac{y_i}{l_i} * \frac{l_i}{n_i}$$

where  $l_i$  is the active labour force in a given region,  $y_i$  is regional GVA and  $n_i$  is regional population.

The following formulas apply:

$$T = T_{prod} + T_{emp}$$

$$T_{emp} = \sum_{i=1}^n \left[ \frac{y_i}{Y_c} \ln \frac{\frac{l_i}{L_c}}{\frac{n_i}{N_c}} \right]$$

$$T_{prod} = \sum_{i=1}^n \left[ \frac{y_i}{Y_c} \ln \frac{\frac{y_i}{Y_c}}{\frac{l_i}{L_c}} \right]$$

$L_c$  is the total labour force of a country, the rest of the notation was explained above. We combine the within-between decomposition with the productivity-employment decomposition in order to find out where the sources of disparities lie.

## Annex 2

### Regions analysed

be1	de6	el3	es51	fr41	fr83	itg1	nl2	ukh	at32	se33	mt	sk04	bg41	pl51
be2	de7	el4	es52	fr42	ie01	itg2	nl3	uki	at33	cz01	hu1	ro11	bg42	pl52
be3	de8	es11	es53	fr43	ie02	ith1	nl4	ukj	fi19	cz02	hu21	ro12	pl11	pl61
dk01	de9	es12	es61	fr51	itc1	ith2	pt11	ukk	fi1b	cz03	hu22	ro21	pl12	pl62
dk02	dea	es13	es62	fr52	itc2	ith3	pt15	ukl	fi1c	cz04	hu23	ro22	pl21	pl63
dk03	deb	es21	fr1	fr53	itc3	ith4	pt16	ukm	fi1d	cz05	hu31	ro31	pl22	hr03
dk04	dec	es22	fr21	fr61	itc4	ith5	pt17	ukn	se11	cz06	hu32	ro32	pl31	hr04
dk05	ded	es23	fr22	fr62	itf1	iti1	pt18	at11	se12	cz07	hu33	ro41	pl32	
de1	dee	es24	fr23	fr63	itf2	iti2	ukc	at12	se21	cz08	si01	ro42	pl33	
de2	def	es3	fr24	fr71	itf3	iti3	ukd	at13	se22	ee	si02	bg31	pl34	
de3	deg	es41	fr25	fr72	itf4	lu	uke	at21	se23	cy	sk01	bg32	pl41	
de4	el1	es42	fr26	fr81	itf5	iti4	ukf	at22	se31	lv	sk02	bg33	pl42	
de5	el2	es43	fr3	fr82	itf6	nl1	ukg	at31	se32	lt	sk03	bg34	pl43	

### Notes

- 1 See figure 2, Annex.
- 2 [http://ec.europa.eu/regional\\_policy/en/funding/erdf/](http://ec.europa.eu/regional_policy/en/funding/erdf/)
- 3 [http://ec.europa.eu/regional\\_policy/en/funding/social-fund/](http://ec.europa.eu/regional_policy/en/funding/social-fund/)
- 4 [http://ec.europa.eu/regional\\_policy/en/funding/cohesion-fund/](http://ec.europa.eu/regional_policy/en/funding/cohesion-fund/)

### Literature

- Bartkowska, Monika; Riedl, Aleksandra, Regional convergence clubs in Europe: Identification and conditioning factors, in: *Economic Modelling* 29/1 (2012) 22-31.
- Becker, Sascha O.; Egger, Peter H.; Von Ehrlich, Maximilian, Going NUTS: The effect of EU Structural Funds on regional performance, in: *Journal of Public Economics* 94/9-10 (2010) 578-590.
- Beugelsdijk, Sjoerd; Klasing, Mariko J.; Milionis, Petros, Regional economic development in Europe: the role of total factor productivity, in: *Regional Studies* 52/4 (2018) 461-476.
- Borsi, Mihály Tamás; Metiu, Norbert, The evolution of economic convergence in the European Union, in: *Empirical Economics* 48/2 (2015) 657-681.