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EAST-WEST DEMOGRAPHIC DIVIDE IN THE EU: A REGIONAL OVERVIEW

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The goal was to examine demographic differences between former communist regions and other regions of the EU. Besides providing a regional overview of EU's demographic differences, we question whether the subnational approach offers any new insights into the East-West divide. This cross-sectional study was conducted on 1,155 EU's NUTS3 regions from 2014. These regions are grouped in two groups: regions that were part of a communist country, and other regions. Mortality, fertility and age structure indicators were tested between the two groups of regions. GDP/c was used to control for differences in economic development by segmenting the regions into tree brackets: low, medium, and high. The differences were then tested for each indicator. Regional variation within countries for each indicator was also assessed. The gaps exist at regional level and are the widest with mortality and fertility schedule, regardless of GDP/c. Former communist regions on average tend to be slightly younger. Analysis of regional variation showed that subnational approach was warranted when studying East-West demographic disparities, especially when it comes to fertility schedule.

Keywords: *former communist countries, mortality, fertility, ageing, Europe, NUTS 3*

Introduction

Much research in the field of demography confirms that countries which used to have the communist political system, have distinct demographic characteristics (Billingsley, 2010; Mesle, Vallin, 2002; Minagawa, 2013; Sobotka, 2003). Different economic systems, different levels of personal and political freedoms, isolation and many other factors, all contributed to this distinctiveness that many demographic and socioeconomic indicators reflect. Among those are differences in mortality, fertility and the resulting age structure.

Europe's East-West mortality gap was the focus of numerous studies since the fall of the Berlin Wall (Caselli et al., 2002; Grigoriev et al., 2014; Meslé, 2004; Mesle, Vallin, 2002; Vallin, Meslé, 2004). They all conclude

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that countries in Eastern Europe have higher mortality rates than their counterparts in the Western Europe. Though this gap is closing, the momentum varies across many facets. One facet is geographical; some countries are converging quickly, others less so. There are also other facets of this gap; one is age specific; another is cause-specific (of death). When it comes to mortality, this study will focus on geographical and age facets of the mortality gap.

Fertility gap in Europe does not share the same borders with the mortality gap, namely, besides Eastern and Central Europe lowest low fertility was endemic across South Europe since 1990 (Kohler et al., 2002). While contrasting Western and Northern European countries, especially France and Sweden, achieved relatively high fertility rates, former communist countries of Eastern and Central Europe went through (socioeconomically) turbulent 1990s. During this period low fertility in those countries appeared largely as an effect of the delay of childbearing (Sobotka, 2003). Both economic and cultural factors to varying degree affected the timing of childbearing (Mynarska, 2010). Only after the end of fertility age of a given cohort we can know for certain whether the fertility is truly going up or down and at which rate. While the East's cohort fertility rates are yet to begin recuperating, the recuperation in the West has already started with the 1956-1960 cohort (Castro, 2015). According to current trends cohort fertility is not likely to increase in the foreseeable future in Central and Eastern European countries, decline or stagnation are more likely scenarios (Frejka, Gietel-Basten, 2016). Although not included in this study, Serbia and Croatia are former communist countries, characterized by contraction of the fertile age group, coupled with low fertility rates of their most fertile, 20-24 age group (Magdalenić, Vojković, 2015), confirming that they are more similar to countries like Poland and Romania.

The historical gap in mean age at childbearing between East and West does seem to be closing quickly, at least in some countries (Burkimsher, 2015). With this nearing convergence, it is not surprising that diminishing effect of the childbearing delay is primarily responsible for recent upturns in period fertility across Europe (Bongaarts, Sobotka, 2012). Spéder and Kapitány (2014) pointed out that there is a failure to realize fertility intentions in certain Eastern European countries, and suggested that social anomy, characteristic for post-communist countries, may be the at the root of their low fertility problem.

Current age structure is the direct consequence of fertility and mortality patterns. Population ageing is the problem facing all European countries to varying degree (Keenan et al., 2016). It is, therefore, important to examine the etiology of any instance of population ageing, since both low levels of mortality and fertility can be the causes. On the one hand, there

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is ageing from the top, caused by lowering mortality rates, present in most of the developed countries, i.e. the ones with highest life expectancy. On the other, there is ageing from the bottom, caused by low fertility rates. This ageing from the bottom is reality facing all of the former communist countries. Ageing from the top, caused by rising number of the very old, is a phenomenon affecting mainly European countries that did not belong to the Eastern bloc.

The regional approach

The bulk of research on East-West demographic differentiation in Europe compares countries which used to have communist regimes to those that did not. One problem with this approach is that there is a sharp difference in the economic development of former communist countries and the rest of Europe. Almost all former communist countries have lower gross domestic product per capita (GDP/c) than rest of the countries of the EU (except Slovenia). The huge disparity in economic development can obfuscate many of the demographic and sociological phenomena that we study. The wealthy countries can have underdeveloped regions, and former communist countries that are poor can have regions which are more developed. This problem of economic development disparity can be, at least partially, circumvented by comparing regions of similar economic development. Although it is not a perfect (apples–to–apples) comparison, this approach offers insights that can be lost in the usual national approach.

Uneven economic regional development in the EU has been studied extensively (Ballas et al., 2017; Boldrin, Canova, 2001; Bouvet, 2010; Rodríguez-Pose, Tselios, 2009) and has been a hot topic in terms of EU's policy. Regional demographic differences, on the other hand, have been studied mainly in the national context, rather than on EU level. There is a good reason for that. Many demographic phenomena are country specific. On the policy side, measures to effect demography are by definition problematic, and not to mention more difficult. Ageing, as the final product of demographic processes, and particularly its effects on economy are increasingly popular subject for regional research (Álvarez, Morollón, 2016; Crespo Cuaresma et al., 2016; Van Der Gaag, de Beer, 2015).

Another problem with comparing country to country is that today's national borders do not completely follow the pre-1989 divide. If we were to view Germany as a whole, the characteristics of the former communist East would not be as pronounced. The subnational approach is being used increasingly (Bryant, Graham, 2013; Johnson et al., 2015; Klüsener et al., 2013) with ever growing data availability.

Nevertheless, there are important caveats with the research of regional demographics of Europe. Even though Communism probably left its marks, the East-West demographic differentiation was present well before its establishment. We know that infant mortality had started falling in Western Europe at the end of 19th century (Corsini, Viazzo, 1993), and the demographic transition, and with it mortality transition, started earlier in the West than in East Europe, resulting in differing population structures. Historically, there were even differences between Eastern and Western German principalities, which now correspond to the federal states of Germany (Klüsener, Goldstein, 2016). Hence, already existing disparities were accentuated by the changes to come in the 20th century. Although former communist countries of Europe had differing experiences, many of which were beneficial (such as rapid industrialization of mainly agrarian societies), the net effect of the communist social experiment on countries' demographic characteristics is widely perceived to be negative. Even though the communist experience had in itself affected the demography, so did the period of economic and political transition, after the fall of the Berlin Wall, which was turbulent and marked by recession and poverty.

Demographic, regional studies are often intranational, focusing on all or specific regions within one country. In this study, we explore demographic characteristics at regional level transnationally to examine how regions of the former communist countries compare to the other regions of the EU, while controlling for economic development. That is, to offer a glimpse of EU's regions' demographic characteristics and examine the differentiation. We explore regional variations of demographic indicators within the two blocs and within each country. Furthermore, the regional approach to studying demographic phenomena can offer new insights needed to encourage interdisciplinary research and help policy makers.

Data and methodology

Data

The lowest regional level with available demographic data for the comparison is NUTS 3 level. NUTS stands for the Nomenclature of Territorial Units for Statistics, and level 3 is a region with population size anywhere between 150 000 and 800 000 people. All data, including vital statistics and population age and sex structure data, is provided by Eurostat (2017a). The most recent year of the data that is available for a significant portion of NUTS 3 regions is 2014. The Eurostat database contains data on 1632 NUTS 3 regions. However, the data is not complete, i.e. the data are missing for some countries and regions. Further, the mentioned num-

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ber of regions includes overseas territories, as well as all the NUTS 3 regions of Turkey, which are outside the scope of this study. The reasoning behind this exclusion is the absence of former communist counterpart regions with traditionally higher fertility rates from the dataset (e.g. Albania, Kosovo). The final number of regions included in the analysis is 1,155 from 26 different countries, out of which 268 regions are from 8 former communist countries. All 1,155 regions belong to the European Union member states.

R package "eurostat" was used (Lahti et al., 2017) for data acquisition. One instance of erroneous viral statistics data was found in the case of single German region (Altenburger Land), so the data from German national statistics was used instead (German Federal Statistical Office, 2017). Geographic information system (GIS) data used for maps was provided by Eurostat/GISCO (2017b; 2017c).

Indicators

Since the goal of this study is to discern the difference between populations of European regions, a wide variety of mortality, fertility and age structure indicators was used (21 in total). The limiting factor being the data availability.

Mortality indicators include crude death rate (CDR), standardized mortality rate (SMR), life expectancy at birth (LE0) and the age of 65 (LE65). While Eurostat directly provided crude death rate, the rest of the mortality indicators were computed. Revised standard European population (Pace et al., 2013) as used to calculate standardized mortality rates. Life expectancy indicators were computed using abridged life tables, constructed from vital statistics and age structure estimates provided by Eurostat.

Fertility indicators include crude birth rate (CBR), total fertility rate (TFR – average number of children per woman), general fertility rate (GFR – number of children per 1000 fertile age women), age specific fertility rates (ASFR) and mean age at childbearing (MAC). Like CDR, CBR was directly provided by Eurostat, while other fertility indicators were computed. TFR includes ASFR for 10–14 and 50–54 age groups, while GFR is calculated per 1000 women aged 15-49. ASFRs are given for five-year age groups, beginning with the 10–14 and ending with the 50–54 age group. MAC was calculated using the same data.

For general indicators of age structure mean age and median age were chosen along with ageing index (AI), as a proportion of people older than 65 and those younger than 15. However, there is also a need to examine the age structure in the context of fertility, so fertility ratio (FR) was also chosen. Fertility ratio was calculated as a percentage of females aged 14-49 in the total population.

There were too few regions with available data for calculating GDP/c for 2014, so the data from 2013 was used. This approach was preferable to the imputation of the many missing values for 2014. Furthermore, the discrepancies between data are tolerable given that we do not use it as a continuous variable but as binning criteria (see below for details).

Statistical analysis

The entire dataset (N=1,155) was split into two groups: former communist (n=314) regions and other regions (n=841). The groups were then compared for each indicator using t-test. Although data violates the parametric assumption of normality, sheer sample size makes t-test appropriate. Due to unequal sample sizes between the groups, Welch's t-test was used. Another advantage of Welch's t-test is its robustness to heteroscedasticity (Welch, 1947), which was present with nearly all of the indicators between the two groups.

The problem of economic development disparity and its possible effects on demographic phenomena was addressed by separating regions into three groups depending on their GDP/c: low, medium and high. Since there are fewer former communist regions, they were used to determine grouping criteria. Their GDP/c ranged from €2846 (in Bulgarian Silistra Province) to €36762 (in Eastern German city Potsdam). This range was split three-way using Jenks natural breaks classification method, and then other regions were assigned to GDP/c bracket they belong to:

- low (GDP/c < €13983), with 212 former communist regions and 51 other regions
- medium (GDP/c €13983–€25821) with 78 former communist regions and 291 other regions
- high (GDP/c > €25821) with 24 former communist regions and 499 other regions

This approach was preferable to using GDP/c as a continuous variable in an analysis of covariance (ANCOVA) or multiple regression models which would violate the assumptions with many of the indicators used. Robustness of Welch's t-test to unequal sample sizes (Fagerland, Sandvik, 2009), makes it a more suitable alternative. Furthermore, the results obtained using the selected approach are easier to interpret and understand, than the results obtained using the alternatives in the form of general linear models.

Regional variation was examined in two ways: internationally, by comparing the two groups of regions while ignoring national borders and intranationally, by considering regional variations within each country. We use the coefficient of variation (CV), calculated as a ratio of the standard deviation and the mean for each demographic indicator. Krishnamoorthy &

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Lee's (2014) modified signed-likelihood ratio test (M-SLRT) for equality of CVs was used to determine whether the differences in relative variance are significant internationally between the two groups. To test whether the regional variation in former communist countries differs from other countries of the EU we use Mann–Whitney–Wilcoxon U test on CVs computed for each country.

Results

Means comparison

Results of the Welch's t-test between the two groups in Table 1 show significant differences across many of the demographic indicators tested.

Table 1
Mean comparison of demographic indicators between the former communist and other regions

	μ			*t*		
Indicators	Former communist n=314	Other n=841	*t*	Low GDP/c n=262	Medium GDP/c n=369	High GDP/c n=523
CDR	12.26	10.24	-12.84***	-3.42***	-6.76***	–4.72***
LE0	77.26	81.59	29.71***	23.76***	11.52***	5.48***
LE65	17.68	20.17	29.64***	18.28***	12.37***	4.14***
SMR	9.59	6.94	-27.31***	-21.97***	-11.61***	–5.51***
CBR	9.22	9.02	-2.08*	-10.58***	1.16	0.35
TFR	1.5	1.54	3.2**	-9.84***	-1.92	4.29***
GFR	42.07	41.36	-2.16*	-10.15***	-4.32***	–1.97
ASFR 10–14	0.47	0.08	-7.1***	-2.76**	-1.3	–1.97
ASFR 15–19	19.87	6.93	-16.16***	-11.24***	-8.14***	–7.88***
ASFR 20–24	58.04	38.64	-15.91***	-15.25***	-7.03***	–0.91
ASFR 25–29	96.42	92.58	-3.05**	-11.52***	-4.77***	3.37**
ASFR 30–34	81.16	104.31	22.07***	3.81***	4.2***	5.42***
ASFR 35–39	36.22	53.83	26.12***	9.35***	9.94***	1.77
ASFR 40–44	6.57	10.56	22.68***	5.38***	12.71***	2.82**
ASFR 45–49	0.29	0.6	15.28***	6.7***	9.97***	2.55*
ASFR 50–54	0.01	0.05	10.18***	3.15**	6.66***	4.04***
MAC	29.22	31.05	23.39***	17.44***	10.81***	3.74***
FR	0.28	0.28	2.44*	-3.23**	6.91***	2.54*
AI	1.39	1.45	2.01*	7.24***	-5.59***	–5.77***
Mean age	42.91	43.41	2.72**	7.45***	-5.83***	–4.75***
Median age	43.26	44.19	3.61***	6.52***	-5.42***	–2.91**

*p<0.05, **p<0.01, ***p<0.001
μ – mean for each of the two groups
t – statistic for Welch's t test

The difference in mortality indicators is the starkest, which was expected since the same difference is well known at the national level (Mesle, Vallin, 2002). This differentiation follows the economic development gap, which is not surprising given the relationship between economic development and mortality indicators (Preston, 1975). Mean LE0 is 4.33 years shorter in regions of former communist countries. The differences in LE0 are significant regardless of the GDP/c bracket. That is to say when we compare mortality indicators of regions with similar GDP/c, the regions that used to be communist still stand out significantly. Mortality gap exists regardless of economic development; though the higher GDP/c is, the narrower the mortality gap becomes. Such results may partially be due to the logarithmic nature of the relationship between GDP/c and LE0, first described by Preston (1975). Namely, the differences in the GDP/c within the low bracket account for greater gains in LE0, than the same differences in the high GDP/c bracket.

Fertility gap between the two groups of regions is not as wide. TFR is higher in other regions. When the regions are compared within three GDP/c brackets, the results show that these differences in fertility are not uniform and that they depend on the particular GDP/c context. Among the poorest regions, the ones from former communist countries tend to have higher TFR – in the medium bracket, there are no significant differences in TFR – in the highest GDP/c bracket, other regions tend to have higher TFR.

The aspect of fertility that differs the most between the two groups is fertility schedule, best reflected by 1.83 years lower MAC in former communist regions. Mothers in Western and particularly Southern Europe are delaying motherhood more than mothers in former communist countries. The ASFRs reflect the same fertility schedule difference. Former communist regions have higher fertility rates between the ages of 10–29, while the other regions have higher rates for older ages (30–54). However, lower MAC does not mean higher fertility and vice versa, there are regions with similar MAC and markedly different levels of TFR, like some of the regions of Poland and France or Ireland and Spain (Figure 1).

As it was the case with fertility indicators, differences in age structure between the two groups of regions are much less pronounced than the differences in mortality. There is no significant difference in AI, but mean and median age are lower in former communist regions, 0.5 and 0.93 years respectively. When GDP/c is taken into account the differences in ageing become even more evident. Namely, when we look only at lower GDP/c regions, the ones that used to be communist tend to be younger,

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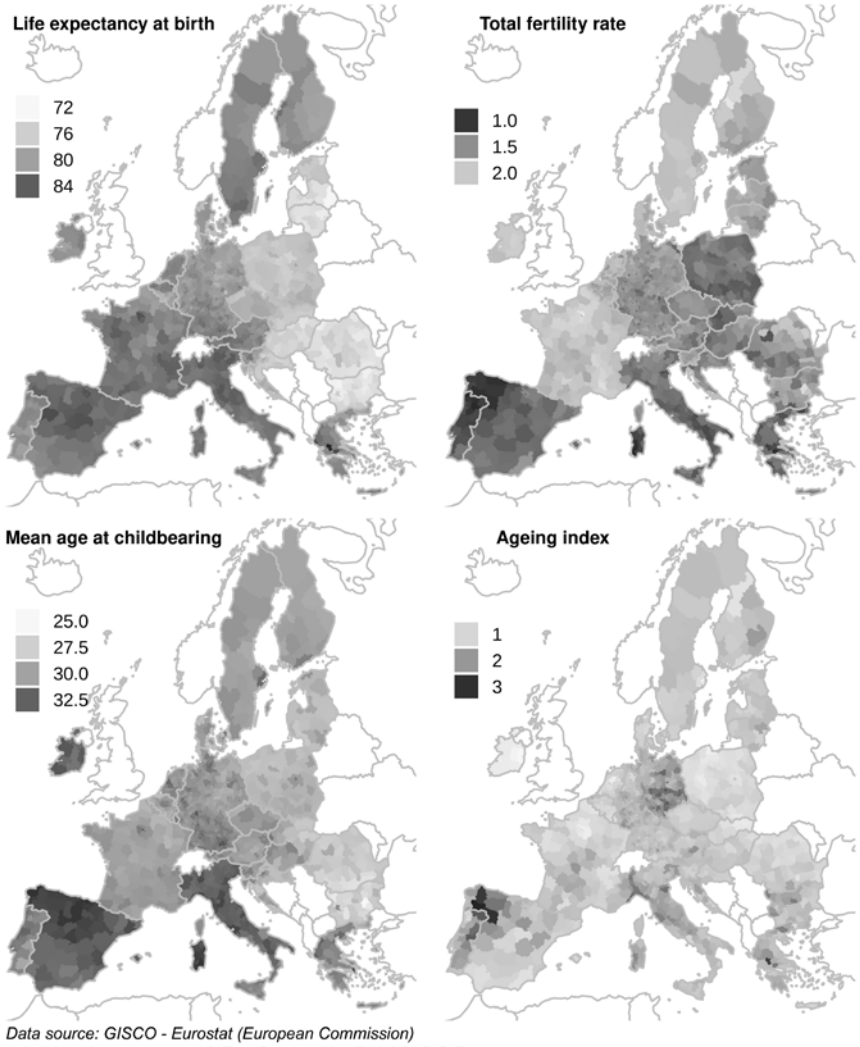
Figure 1
Selected demographic indicators in the EU at NUTS 3 level



Data source: GISCO - Eurostat (European Commission)
Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat.

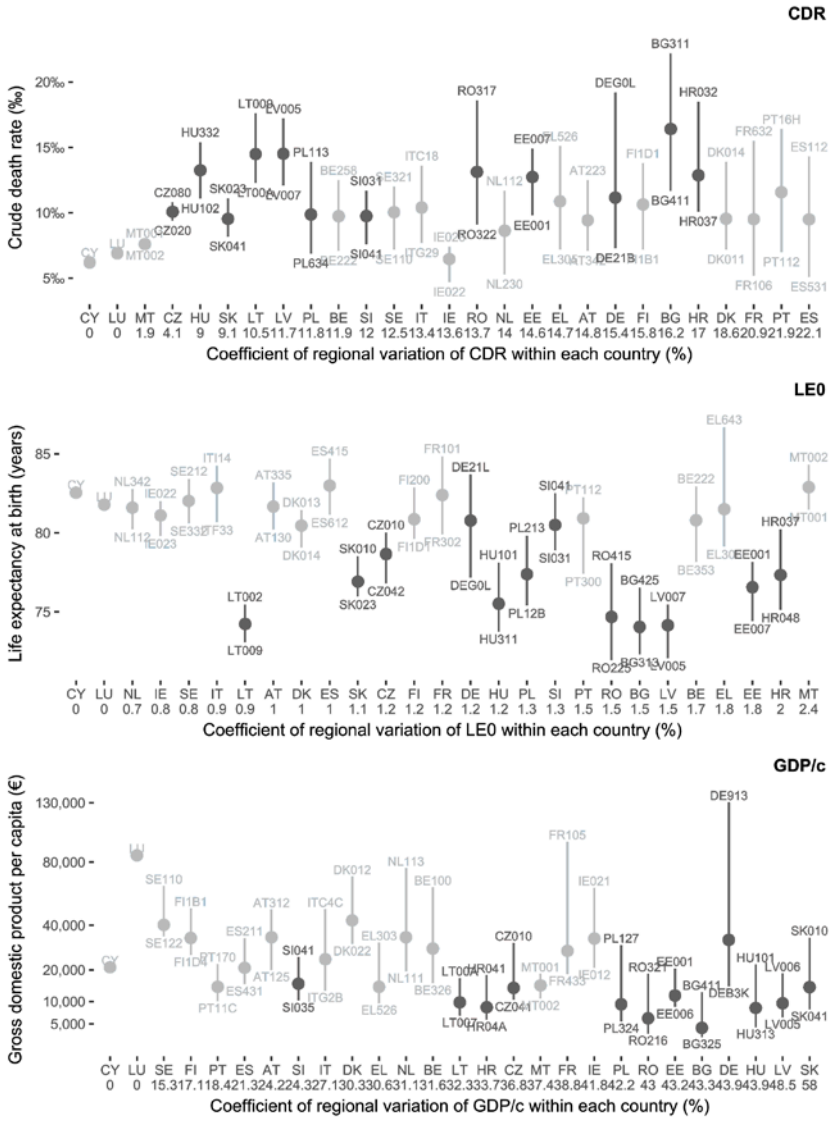
measured by all of the ageing indicators used. In medium and high GDP/c brackets, the other regions tend to be younger.

Regional variation

CVs within each of the two groups of regions show greater variation among former communist regions with mortality, ageing and fertility schedule indicators, but not with the indicators of fertility levels, which

vary more in other regions (Table 2). Greater variation of fertility levels among other regions is due to big differences between regions from Southern European countries and the rest of the EU's non-communist regions. Test for equality of CVs (M-SLRT) showed that these differences were significant with almost all indicators (except some of the ASFRs). GDP/c also varies more among former communist regions.

Figure 2
Regional variation of CDR LE0 and GDP/c in former communist and other countries of the EU



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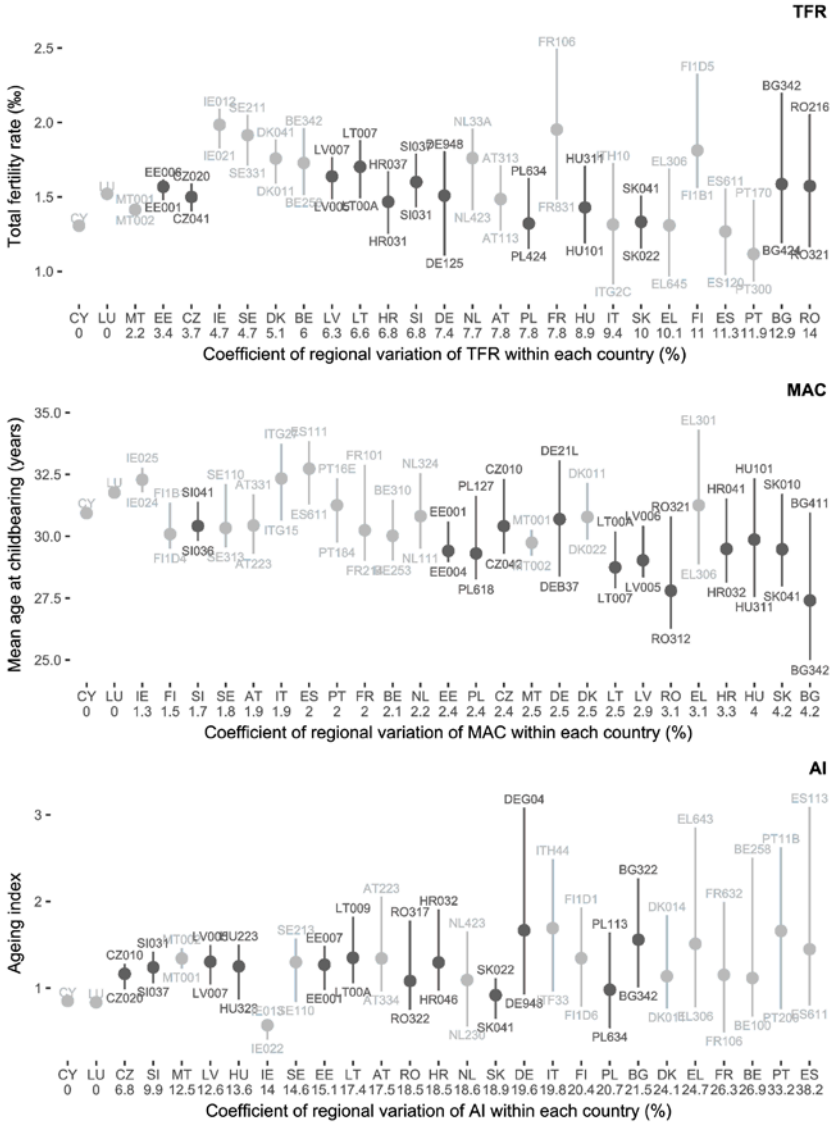
Besides calculating CVs for the two groups of regions, CVs for each country were calculated as well, in order to ascertain the level of intranational regional variation of demographic indicators (Table 2). Regional income inequality (measured by GDP/c) is greater in former communist countries. In comparison, no demographic indicator shows such a big difference between former communist and countries in terms of regional inequality.

Figure 3

Regional variation of TFR, MAC and AI in former communist and other countries of the EU



MAC, which is a correlate of GDP/c, comes close, being the demographic indicator that also varies more in former communist countries. Another strong correlate of GDP/c, namely LE0, shows significant differences in regional inequality between the two groups of countries (Table 2).

Table 2
Regional variation of demographic indicators, at transnational and intranational level

	CV			Median CV		
Indicators	Former communist regions	Other regions	M-SLRT	Former communist countries	Other countries	U
CDR	0.21	0.17	15.7***	0.12	0.14	111
LE0	0.03	0.02	277.25***	0.01	0.01	48*
LE65	0.08	0.05	139.4***	0.03	0.03	61
SMR	0.17	0.11	119.22***	0.07	0.07	77
CBR	0.14	0.19	30.31***	0.11	0.13	109
TFR	0.12	0.17	51.86***	0.07	0.08	79
GFR	0.09	0.17	125.84***	0.08	0.09	93
ASFR 10–14	2.07	3.28	6.55*	1.19	1.6	95
ASFR 15–19	0.71	0.52	24.12***	0.43	0.31	69
ASFR 20–24	0.34	0.37	2.8	0.25	0.21	75
ASFR 25–29	0.15	0.3	158.48***	0.1	0.15	134*
ASFR 30–34	0.19	0.17	6.08*	0.11	0.09	51
ASFR 35–39	0.27	0.2	38.97***	0.16	0.13	76
ASFR 40–44	0.32	0.35	2.84	0.23	0.23	81
ASFR 45–49	0.8	0.74	0.99	0.72	0.58	65
ASFR 50–54	4.62	2.21	12.22***	2.32	1.57	71
MAC	0.04	0.03	27.12***	0.03	0.02	25***
FR	0.08	0.06	40***	0.03	0.05	119
AI	0.35	0.26	34.11***	0.18	0.2	116
Mean age	0.07	0.05	40.13***	0.03	0.04	122
Median age	0.1	0.07	72.7***	0.04	0.06	126
GDP/c	0.65	0.45	42.07***	0.43	0.27	17***

*p<0.05, **p<0.01, ***p<0.001
CV – coefficient of variation
M-SLRT – modified signed-likelihood ratio test statistic
U – Mann–Whitney–Wilcoxon U test statistic

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Discussion

Findings

The relationship between mortality and economic development is likely behind the high regional variation of mortality indicators in former communist regions, which exhibit higher variation in GDP/c as well. However, high regional variation within countries in LE0 isn't endemic to former communist countries. The country which exhibited highest regional variation in LE0 is Belgium, due to the differences between Flanders and Wallonia, that reflect differences in GDP/c. Mortality divide in Germany does not run only on East-West axis but on North–South axis as well, i.e. life expectancy is longer in southern Germany (Figure 1), matching the regional variation of economic conditions (Kibele et al., 2015).

Not only do former communist countries have younger mothers, but the variation of MAC within former communist countries is significantly higher. This is due to bigger discrepancies between urban and rural MAC in the former communist countries. Namely, there is a tendency for big urban centres to have higher MAC than the peripheral, rural regions. The urban–rural MAC discrepancies exist in the rest of the EU as well (e.g. Parisian and Stockholm regions stand out from other French and Swedish regions), but this discrepancy is more pronounced in the East (e.g. MAC in Bulgarian Sofia region is almost 31 years, while in the Sliven province it is nearly 25 years).

The relationship between economic development and fertility exists at the global scale, as there are many poor countries with high fertility, which are yet to transition to low fertility. Given that all of the EU's countries completed the fertility transition decades ago, the same relationship cannot be observed in this geographic context. Furthermore, the emergence of lowest–low fertility in the 90's in Europe is not a phenomenon that follows the economic development fault lines, as the relatively well off Southern European countries are affected by it as well as Eastern European countries (Kohler et al., 2002). The comparison of TFR between the two groups of regions showed that fertility is only just lower in former communist countries. That result tells us little on the actual differences in fertility. Namely, the "other" regions of the EU are split between regions of countries that have low fertility (Italy, Spain, Germany) and those that have near replacement level fertility that have gone through the second demographic transition like France, Ireland and Sweden (Lesthaeghe, 2014). Partitioning the data-set into three groups based on GDP/c helped little to address this problem. The low GDP/c bracket consists of poorer regions of countries that are predominantly affected by low fertility: Italy, Spain, and Portugal. When compared to those regions, former communist

regions in the same GDP/c bracket showed higher TFR. There was no significant difference in the medium bracket. In the high GDP/c bracket, other regions tend to have higher TFR. This bracket includes many Northern European countries' regions, which contribute to that result.

While former communist Europe is far from a monolith block regarding fertility, the rest of the EU is split. Therefore, it is not surprising that there is more variation in fertility levels in the latter group. This applies to all fertility indicators (except for MAC, whose variation is higher in the former communist group). The urban–rural discrepancies that exist in fertility schedule, are not as pronounced in TFR. Though, the highest fertility regions of France are clustered around Paris (Île de France), the same is not true for other countries. Regional variation of TFR within countries is highest in low fertility countries, leading with Romania, Bulgaria, and Portugal, and regional TFR differences there have little to do with rural–urban divide (Figure 1).

Given the way they are calculated, indicators like CDR, CBR and GFR depend on age structure. Discrepancies between the results obtained when comparing means of regional GFR, CBR, and TFR, come down mostly to differences in age structure. For instance, due to unbalanced age structure (high AI, low FR), fertile age females make up a smaller percentage of total population in East Germany. Those females have lately achieved comparatively higher TFR than their counterparts in the West (Goldstein, Kreyenfeld, 2011). In that case, TFR is high, but in regard to the total population those gains would be registered as meager, and result in lower CBR. This trend of declining CBR and TFR has been observed in France at the national level in 2014 (Mazuy et al., 2015). Similarly, an imbalance in the age structure of fertile age women accounts for differences between TFR and GFR.

When we directly compared the two groups of regions, results showed former communist regions tended to be slightly younger than other regions, measured by mean and median age. Results of the comparisons of AI between the groups revealed no significant differences. This discrepancy between the two measures of ageing exists since AI ignores the middle segment of the population (15–65). Higher fertility in the West for the past decades made the 0–15 population segment bigger than in their Eastern counterparts, but at the same time, lower mortality rates in the West also made older than the 65 segment of the population larger. That is why the ratio of the two age groups does not significantly differ between the two groups. The discrepancy between AI and mean and median age, tells us that the real difference lies in the 15–65 segment of the population. Reher (2015) distinguishes between two types of countries: the ones where the baby boom was strong, and the baby bust was relatively weak

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(Type A), and where the baby boom was weak, and the bust appears to have been strong (Type B). He points out that ageing will be much harder for the Type B countries. Former communist regions studied here belong to Type B countries.

When examined by GDP/c brackets, mean and median age show that among the lower GDP/c regions former communist regions are younger. This is the result of the stark mortality difference in the lower GDP/c bracket, which was found to be the biggest demographic difference between the regions. In that group, poorest former communist regions are compared to poorest regions of other countries that tend to be regions of the Mediterranean countries, famous for their traditionally lower old age mortality rates and longer life expectancies (Mesle, Vallin, 2002). The product of high mortality in the poorest former communist regions is a lot smaller older population, which results in the younger population. One important point regarding mortality, and its effect on age structure is that the differences between sexes are much higher in former communist countries (Botev, 2012). Among regions with medium and high GDP/c, where mortality differences are not as great, other regions tend to be younger.

Migration has a major role in shaping the age structure, especially on regional level. Although not included in this study, its effects are evident in regional variation of ageing indicators, particularly of AI. Where mean and median age give us a more thorough picture of age structure, AI helps us identify regions with unbalanced age structure. Variation of AI showed that former communist regions as a whole are much more varied in this regard. However, regional variation within each country revealed that countries with highest regional variation of AI are Spain and Portugal, countries with well-known regional income inequalities (Martínez-Galarraga et al., 2015; Santana, 2000). The regional variation of AI doesn't significantly differ between the former communist and other countries of the EU.

Limitations and future research

This paper offers a rough overview of the regional differences. The main limitation being its transversal nature, i.e. being a single year snapshot of the demographic situation. Future research should add time as another dimension which could provide us with the trends as far as possible into the past. Viewing the changes at regional level from the 1989 on the EU level would help us learn how did the demographic indicators changed during the turbulent period at regional level. Another limitation of this paper is regarding the aspect of migration which is absent from this research but plays a major role with many of the demographic phenomena,

especially when it comes to age structure. Future research should include migration component, which would be a big challenge considering the lack of reliable data, especially at lower administrative levels. Adding more socioeconomic variables beside GDP/c would do a lot to help explain the differences between the two groups examined in this paper.

Conclusion

Demographic distinctiveness of former communist countries, apparent at the national level, is present at the regional scale as well. Former communist countries and their regions are demographically distinct in almost every aspect. Their differentiation is pronounced the most with mortality indicators, i.e. mortality conditions are worse in the East. When compared with other regions of similar GDP/c, former communist regions still exhibit significantly lower life expectancy. Albeit, fertility on average tends to be a bit lower in former communist regions; it is the contrast in fertility schedule that truly divides the two groups. Mothers from former communist regions are on average much younger, and that holds true regardless of GDP/c. The former communist regions do tend to be slightly younger. However, the higher mortality rates in the East played a big part in shaping that younger age structure in the East. This is especially the case with economically less developed former communist regions. Former communist regions are a more heterogeneous group when it comes to mortality and age structure, while other regions showed greater heterogeneity of fertility. Even though it's important to examine regional variation transnationally, it is also important to consider regional variation nationally. These two different contexts offer answers to different questions, especially policy-wise. In the national context, life expectancy and fertility schedule vary more within former communist countries. Surprisingly, the measure of young/old balance (AI) does not vary the most in former communist countries, but in countries of Southern Europe.

Is the subnational approach warranted in studying East-West demographic differences in the EU? In case of Germany, it certainly is due to its unique history, but is it preferable in general EU context? The short, but not complete, answer is yes. It depends on the demographic phenomena being studied. The case can be made that there is little to be gained when studying the differences in mortality subnationally since the differences between East and West are as obvious at regional as they are obvious at the national level. Still, there are important regional differences in mortality, in some of the countries that need to be acknowledged. When it comes to fertility levels, considering the national context is paramount, which makes subnational approach less warranted. However, fertility schedule is

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the aspect of fertility where subnational approach should be preferable, given the differences in regional variation.

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Marko Galjak *

Demografski jaz između istoka i zapada Evropske unije: Regionalni pregled

R e z i m e

Cilj ovog rada je da istraži razlike u demografskim pokazateljima između regiona Evropske unije u odnosu na to da li su pripadali bivšim komunističkim državama ili nisu. U radu je problem demografskog jaza između istočne i zapadne Evrope sagledan na regionalnom nivou. Osim tog pregleda, u radu se postavlja pitanje da li je važno ispitivati razlike u pojedinim demografskim pokazateljima između bivših komunističkih država i ostalih država EU na administrativnom nivou nižem od državnog? Ova transverzalna studija je sprovedena koristeći podatke 1.155 NUTS 3 regiona Evropske unije iz 2014. godine. NUTS 3 regioni su podeljeni u dve grupe u zavisnosti od toga da li su pripadali Istočnom bloku ili ne. Ispitan je 21 demografski pokazatelj među kojima su pokazatelji mortaliteta, fertiliteta i starosne strukture. Dodatno, očigledne razlike u ekonomskoj razvijenosti regiona kontrolisane su pomoću bruto domaćeg proizvoda po stanovniku (BDP/c). Na bazi BDP/c, regioni su podeljeni u tri grupe: nizak, srednji, visok. Prema toj podeli, testirana je razlika između dve grupe regiona za svaki pokazatelj. Tako je ispitana regionalna varijacija na nivou cele EU. Dodatno, ispitana je i varijacija unutar pojedinačnih država za svaki pokazatelj. Rezultati pokazuju da je kod mortaliteta najveći jaz između dve grupe regiona. Mortalitetni uslovi su mnogo lošiji na istoku EU. Ova razlika postoji bez obzira na BDP/c, tj. ekonomski najrazvijeniji regioni bivših komunističkih zemalja imaju u proseku viši mortalitet od ostalih regiona sličnog BDP/c. Iako je fertilitet u proseku niži kod bivših regiona komunističkih zemalja, velika razlika je detektovana samo kada je starosni model fertiliteta u pitanju. Prosečna starost majki pri rođenju je značajno veća u ostalim regionima i to bez obzira na BDP/c. Kada je u pitanju starosna struktura, bivši komunistički regioni su u proseku nešto mlađi, ne kao rezultat viših stopa fertiliteta, već viših stopa mortaliteta. Kada je u pitanju regionalna varijacija unutar zemalja EU, mortalitet i starost majki pri rađanju variraju više kod bivših komunističkih država, dok su varijacije u odnosu starih i mladih veće kod država koje nisu pripadale Istočnom bloku. Analiza regionalne varijacije je pokazala da je regionalni pristup veoma relevantan kada se ispituju demografske razlike između „Istoka“ i „Zapada“ u EU. Regionalni pristup je naročito opravdan kada je u pitanju analiza starosnog modela rađanja.

Ključne reči: *bivše komunističke države, mortalitet, fertilitet, starenje, Evropa, NUTS 3*

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