The Regional Dimension of Economic Growth in Ukraine

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Abstract
Regional asymmetries in Ukraine take the form of deep spatial divisions and gaps. Moreover, their evolutionary route has been influenced by the especially high growth rates of the Ukrainian economy during the first half of the 2000s and the deep recession of 2009-crisis. This paper explores the level of regional inequalities in Ukraine, detects the growth determinants in regions and investigates the spatial development pattern. The analysis shows that the 2009-crisis led the country into a transformational recession and a remodelling of its regional growth pattern.

Keywords: Ukrainian regions, growth, inequalities, crisis

Introduction
Regional inequalities have received enormous interest as regards detection of their definition, measurement of their level, and finding of proper policies for their abatement. Although from an efficiency point of view the generated aggregate economic gains might be significant, regional disparities might hurt or endanger declining regions (Martin 1999). A peculiar case is when regional inequalities take the form of deep spatial divisions and gaps. Such is the case of Ukraine where spatial asymmetries are based on a series of socio-economic parameters. Regional differences have proven to be powerful predictors of mass attitudes and political behaviour (Barrington and Herron 2004).

Ukraine is divided mainly into a Russified and heavily industrialised East, and an ethnically Ukrainian western-oriented West (Kubicek 2000)
leading to high regional disparities and a serious spatial dichotomy. However, researchers support for several spatial divisions of Ukraine (in 2, 4 or 8 parts) leading them to set the question of how many Ukraines actually exist (Barrington and Herron 2004).

Under the compositional character of spatial dichotomy of Ukraine, this paper aims to investigate the regional development pattern and its evolutionary form during the first stage of recovery process (in 2000s) when the country strived to reach the pre-transition development levels with (contrary to the other post-Soviet economies) considerable growth rates, before the 2014-conflict in Crimea.

This paper has a twofold objective. First, it analyses regional patterns Ukraine by investigating the economic and production structure of regions, estimating the magnitude of regional inequalities and exploring their spatial dispersion. Second, it detects the determinants of regional growth with a standard growth model of endogenous development approach for different time periods (2003-2009 and 2003-2013) and investigates the changes in the spatial growth pattern.

The remainder of the paper is organised as follows. The next section highlights the review of the literature. Section III displays a descriptive analysis of the regional pattern of Ukraine, while section IV focuses on the econometric analysis of regional growth. Finally, section V offers concluding remarks.

Literature review

The part of literature that tackles regional development in Ukraine has received limited attention (Demchuck and Zelenyuk 2009). An econometric analysis is followed by a series of studies applying different model specifications. First, the β-convergence hypothesis is examined for the period 1995-2002 and draws the conclusion of a diverging trend of regions, which is associated with economic growth (Skryzhevska 2013). Another econometric analysis attempts to explain the regional differences in GVA per capita for the period 1995-2000 and suggests that the 80% of them are due to differences in physical capital and labor endowments (World Bank 2002).

In order to examine the effects of the fiscal-federalism system on regional growth, a growth model analysis in the regions of Ukraine is conducted concluding that Ukraine’s nascent fiscal-federalism system has been growth-promoting (despite its shortcomings, especially in the
areas of expenditure and revenue assignments). Moreover, relatively poor regions might use the transfers in a growth-conducive fashion (Thieben 2004).

The effect of inward FDI on productivity is investigated by another study (Kokko and Kravtsova 2012) which results show that the overall findings were mainly driven by the development in Western Ukraine, whereas inward FDI in Eastern Ukraine did not seem to have any impact on local productivity growth. This outcome verifies the deep economic and institutional differences between the two parts of Ukraine, which are conveyed in the ability of local firms to benefit from the inward FDI. Therefore, the impact of FDI on the host economy may vary even at the sub-national level, depending on the specific local environment.

According to the empirical evidence of an enterprise survey (Zvirgzde et al., 2013a), the capital region Kyiv attracts market-seeking investors and greenfield investors due to its large market potential, better access to resources and the higher institutional quality of the capital. Lviv region is the first in terms of FDI inflows in the Western part of Ukraine, and Kharkiv region is the first in terms of FDI inflows in the Eastern part of Ukraine (2010 data). The Lviv region, except for having an absolute advantage of being proximate to the EU border, pulls in investors due to its concentration of human capital. The Kharkiv region attracts foreign investments originating from the CIS to serve the local market with pre-established customer-supplier networks.

Regarding the innovation performance of foreign-owned and domestic firms (Zvirgzde et al 2013b), firms located in the capital Kyiv are more product-innovators, and those located in Lviv are more process-innovators. In general, bordering regions still enjoy lower absorptive capacity in comparison to the capital. The economic approaches in innovation development in Ukraine are explored by the application of hierarchical cluster analysis for the 27 Ukrainian regions in 2001 to 2005 and confirm the low degree of convergence between three clusters (Nosova 2014).

Contrary to the common perception about the West-East gap in Ukraine, another study (Demchuck and Zelenyuk 2009) has found no significant differences in distributions and aggregate efficiencies between the agricultural and industrial regions, neither between the West and East regions. However, strong evidence was found for a rapidly increasing gap between the capital (Kyiv) and all the regions since 2001. Moreover, it is claimed that the amount of capital in the region and its
wealth is positively associated with the efficiency level of this region, while unexpectedly it was found that FDI is positively correlated with inefficiency. Similarly, it is claimed that the answer to the question whether there are "two Ukraines" must be "no" as it turns out that the more relevant grouping criterion to analyse between-group income inequality effects is a rural/urban rather than a West/East division of households (Frey 2015).

There is a significant part of the literature that analyses the differences among Ukrainian regions referring mainly to the West-East dichotomy, which is based on socio-political perceptions. Specifically, the degree to which perceptions of Russian-Ukrainian relations vary significantly by region within Ukraine is evaluated (Hesli 1995). The persistence of regional divisions in the country based on public opinion, electoral results, and voting by parliamentarians is remarked. While there is little evidence to suggest that regionalism is becoming more acute, it is clear that, in respect of concerns central to the Ukrainian polity, it is not subsiding (Kubicek 2000). By another point of view the determinants of persistent regional political cleavages in the post-Communist Ukraine are examined and it is argued that this West-East divide in electoral behavior has been more or less stable during the entire period of Ukrainian independence during the period 1991-2006 (Katchanovski 2006). In any case, it is believed that there is danger of ignoring intra-state regional variation and that any regional gap is not simply the result of compositional effects but of political cultural divisions (Barrington and Herron 2004).

Finally, there are few studies with a more policy-driven orientation that suggest a given emphasis to the regulatory and legal basis of regional policy, and specifically to more effective mechanisms of regulation in the interrelations of central bodies of executive authority with regions and regions between themselves, to a greater efficiency in the application of certain legislative instruments of stimulation of regional development, and to the promotion of a strategy of spatial economic development on the basis of formation of the growth poles (Ye 2014).
Descriptive analysis

Ukraine is one of the largest countries in terms of population size (eighth in 40 countries in Europe) and while the economy occupies a middle position in terms of GDP size (21st in Europe), it has strong potential, and since during the 2000’s it has recorded considerable high growth rates. Particularly, in 1999 the country presented a positive growth change for the first time after the breakup of the Soviet Union, while afterwards during the period 2000-07 (except the year 2005) it displayed considerable high growth rates ranging from 6% to 13%. Therefore, following the lost decade of the 1990s Ukraine had been witnessing some of the highest growth rates in the region, dynamic business activity and increasing interest from foreign investors (Drzeniek-Hanouz and Geiger 2008). However, despite these records the economy has not been fully recovered from the transition process even before the deep recession of 2009 (in 2008 was 83.5% of 1990 levels) or the crisis of 2014 (in 2013 was 79% of 1990 levels).

The country before the 2014 crisis consisted of 27 administrative regions (Figure 1) of which two are cities (Kiev and Sevastopol) and one (the Crimea region in the southern part of the country) was under a peculiar status. The ‘Autonomous Republic of Crimea’, as it was officially called, had a significant ethnic Russian majority and due to its separatism it had limited autonomy (Kubicek 2000).

It is important the potential dynamics and prospects of the Ukrainian economy to be studied along the existed serious spatial asymmetries and regional differences. The most prominent and distinguishable regional gap is that between the Eastern and Western area. The cartographic depiction of the development (measured by GDP/capita) and population dynamics in Figures 2 and 3 reveals the existing profound regional differences that take the form of a West-East development dichotomy. The Eastern area is more developed than the Western area as it displayed higher than the national average GDP per capita values, while it experienced in average smaller negative growth rates as well as the only positive growth rate recorded in the country during the period 2000-2013. Moreover, the Eastern area is characterised by a greater population capacity due to its higher population size despite the larger negative population changes that experienced during the period 2000-2013.

Fig. 1. Administrative regions of Ukraine, 2013

Source: Authors’ elaboration from SSC of Ukraine (2015)

Fig. 2. GDP/capita levels (2013) and GDP/capita growth (2000-13) in the regions of Ukraine

Source: Authors’ elaboration from SSC of Ukraine (2015)
It should be accentuated that this West-East division has deep roots in various aspects and manifold dimensions. On the one hand, the Eastern region is the most heavily industrialised and urbanised area of the country opposed to the Western area, which is based mainly on agriculture and light industry. This spatial asymmetry is evident in Figure 4, which shows the sectoral specialisation of each region on the basis of its dominant sector. Particularly, the specialisation level is estimated by the relative Theil index (Theil 1967), which measures the heterogeneity of a region in relation to the country in specialisation terms and therefore reveals the comparative advantage of each region. The index is calculated in the three broad sectors (primary, secondary, tertiary) and has the following form: $T_i = \sum_{j=1}^{J} a_j(i) \ln \left( \frac{a_j(i)}{a_j} \right)$, with $0 \leq T \leq \ln(1/a_j^*)$, where $a_j^*$ as the minimum value in the range of values $a_j$; i denotes the region, J indicates the total number of sectors in which region i specialises, and $a_j(i)$ is the share of each sector in the region. This entropy index, due to its decomposition ability, returns different values of specialisation for each region and each sector. Thus, Figure 4 shows the sector with the higher relative specialisation index for each region.

region. At this end, it exhibits the spatial specialisation pattern in which the Eastern area specialises in the secondary and tertiary sector while the Western area in the primary sector underlying consequently the serious production diversity and spatial heterogeneity between the two areas.

On the other hand, there are not only economic dissimilarities but also different social and political perceptions that separate the two parts of the country. In the Eastern area there are extensive cross-border links and maintaining ties with Russia indicating the notable residual ‘Soviet’ identity of the area. The serious decline in industrial production that the area was experienced during its transition to the open market led to a further preservation of the Soviet-era support system. The Western area, on the contrary, is characterised by anti-Moscow perceptions and with a West-European orientation (Kubicek 2000).

Fig. 4. The dominant sectors of relative specialisation in the regions of Ukraine, 2013

Therefore, the development gaps as well as the social differences between the Eastern and the Western areas figure as a stereotype. An extensive literature has underlined the various differences between the two areas, especially after the dissolution of Soviet Union when they got more acute, on basis of economic structure, history, language, religion, or relations with Russia (Kokko and Kravtsova 2012, Barrington and Herron 2004, Birch 2000, Kubicek 2000, Wolczuk 2006). The importance of this division into Eastern and Western is revealed by becoming more and more an important question not only internally, but
also in geopolitics between Russia and the West (Demchuck and Zelenyuk 2009).

After the analysis of the deep West-East development gap in Ukraine, the magnitude of the regional disparities is investigated based on a cross-regional analysis and the sigma-convergence approach (σ-convergence, Boyle and McCarthy, 1997). This refers to the evolution of disparities among regions by evaluating how the dispersion of regional values changes over time. The most frequently used measure of σ-convergence is the weighted coefficient of variation of regional GDP per head. According to Figure 5, the weighted coefficient of variation of GDP per capita noted a significant increase in 2000-2003 which coincides with the period that the country experienced positive (and considerable high) growth rates for the first time after the recession. After this upturn the level of regional inequalities seem to have been stabilized despite the subsequent especially high growth rates (of range 8-13% for the years 2004, 2006 and 2007) or negative growth rates (-15% for the year 2009). The initial sharp increase in regional inequalities verifies claims that countries transitioning to market economies generally begin with low regional disparities and experience initial increases (European Commission 2001, Petrakos 2000, Arbia et al 2011, Thomas 2009), and that the capital regions are the clear winners of the post-socialist transition and the integration process (Heidenreich 2008).

![Fig. 5. Weighted coefficient of variation of GDP/cap in the regions of Ukraine, 2000-2013 (left) and GDP per capita growth, 2000-2013 (right)](source: Authors’ elaboration from SSC of Ukraine (2015))

The time-series increase of regional disparities is next studied by a diagrammatic analysis that examines the spread of regional values around the national average and the evolution of recorded disparities over time. The economic indicators that are used for the analysis of regional inequalities are: a) GDP/cap, b) average monthly wages per employee, c) ratio of enterprises in the total population, d) inward foreign
direct investments (FDI) per capita, and e) share of employment in R&D activities in the total employment. According to Figure 6, the following conclusions stand out: first, the city of Kiev presents the highest value in all variables constitutes an outlier in the distribution scatters. Additionally, the value of the capital city has been further increased in nearly all the cases during the period 2000-13, implying an explicit divergence trend. The only exception to that is the case of the wage levels in which the value of Kiev city shows a smaller deviation which gets even smaller in the year 2013.

Second, the largest dispersion of values in the regions for the year 2013 is displayed in the FDI/cap variable due to the extremely high values of Kiev-city and of the following region (of Dnipropetrovsk) confirming the highly spatially selective character of foreign investment. Similarly, the employment in R&D share presents an expectably large deviation of values as there are specific regions in which a large share of the labour force is engaged in innovative activities (mainly by the city of Kiev and the region of Kharkiv).

Third, as concerns the changes in the spread of values during the period 2000-13, the highest increase was presented in the GDP/cap variable in which the higher values recorded larger increases signifying the rise of regional inequalities. On the contrary, the variation has been further limited in terms of wages, indicating their conservation in relatively similar levels in all regions.
Finally, the β-convergence hypothesis is investigated (Barro and Sala i Martin, 1990) that tests whether regions of higher development level present higher growth rates. Figure 7 depicts a scatter plot of unconditional β-convergence presenting the positive correlation of the GDP per capita growth with the initial GDP per capita in regions. Thus, it is signified that regions with an initially higher development level display higher growth rates diverging from the others (significant at the 5% level, in the case of exclusion of Kiev city, the results also indicate a divergence trend of regions, however of lower statistical significance). This diverging trend, which is emanated mainly from the metropolitan dominance, has been broadly supported at the theoretical as well as the empirical level, and is formed by the structural reorganisation of the economy (Fujita and Thisse 1996, Arvanitidis and Petrakos 2008).
In this section, the determinants of growth in Ukrainian regions are estimated using a standard endogenous growth model (Barro 1990). The econometric model is based on panel data as it studies the 27 administrative divisions of Ukraine for the periods 2003-09 and 2003-2013. The econometric model is estimated in two different time periods in order to capture changing spatial development patterns after the 2009 crisis.

First, the convergence hypothesis is examined by a simple β-convergence model: 
\[ GR_{i,t} = b_0 + b_1GDPCAP_{i,t} + e_{i,t}, \]
where \( GR \) denotes the real GDP per capita growth for the time period \( T \), \( GDPCAP \) denotes the GDP per capita for the initial year \( t \) of the period \( T \), \( b_0 \) is the constant term, \( b_1 \) the estimator of the independent variable and \( e \) the disturbance term \((e_{i,t} \sim N(0, \sigma^2_{i,t}))\). The model is estimated under the period weights estimation method, which is a variant of the panel corrected standard errors (PCSE) estimation method. The errors of any regression model may be non-spherical, a problem that is much more acute for time-series-cross-section (TSCS) models (Beck and Katz 1995). For this reason, a superior way to handle TSCS data is to estimate the ordinary least squares coefficients and to compute the PCSE (Petrakos et al. 2012).

According to the results of a simple equation model (Table 1 equation 1 and Table 2 equation 1), regions with initially higher GDP per capita level display higher growth rates signifying an unconditional regional divergence trend. A quite interesting point relies on the fact that the
divergence trend is not stable over time but it is affected by the crisis period. In the case that a time interaction term is added in the econometric model by the dummy variable REC that takes the value 1 for the years of record negative growth rate and 0 otherwise, the negative sign of b coefficient changes to positive implying a convergence trend during the period of deep recession. The results are similar for both time periods under study and thus the trends characterised by robustness.

As a next step an extended form model (Barro and Sala-i-Martin 1992) is estimated with the following specification:

\[
GR_{i,t} = b_0 + b_1 GDPCAP_{i,t} + b_2 GDPCAP_{i,t} \cdot REC_{i,t} + b_3 SCALE_{i,t} + b_4 SPECI_{i,t} + b_5 SPECIII_{i,t} + b_6 OPEN_{i,t} + b_7 OPEN_{i,t} \cdot EAST_{i,t} + b_8 FDI_{i,t} \cdot EAST_{i,t} + b_9 SGR_{i,t} + e_{i,t}
\]

The definition of the variables and the interpretation of the econometric results are next presented. All data are sourced from the State Statistics Service of Ukraine (SSC of Ukraine 2015). The results of the regression models are presented in Table 1. It should be noted that the inclusion of the conditional variables in the econometric model does not change the signs of the ‘convergence factors’ (Borota and Kutan 2008), supporting the robustness of our results. Additionally, problems of multicollinearity are resolved by regressing different econometric models with the intention to segregate any highly correlated variables.

First, the economies of scale have received significant attention for their role in economic growth, first with Marshall (under perfect competition) and then with Krugman and the new economic geography theory (under non-perfect competition). This factor is included in the econometric model using the SCALE variable, which is the average firm size, and is estimated using the ratio of the employment to the number of enterprises: \( SCALE_i = \frac{L_i}{NF_i} \), where \( L \) is the employment, \( NF \) is the number of units and \( i \) denotes the region (Amiti 1999).

The growth of a region is related to its economic and productive performance and dynamism, which is formed by the fields and the degree of specialisation. However, the influence of an economy’s specialisation ability on growth depends on the kind of specialisation. More specifically, both the specialisation index and the sophistication level of an economy define its developmental path, a fact that has been noted by both theoretical (Grossman and Helpman 1991) and empirical
perspectives (Lau 1992). UNIDO (2009) remarks that low-income countries exhibit a high degree of specialisation in less sophisticated goods, whereas fast-growing low-income countries or slow-growing medium-income countries develop a certain amount of productive diversity and produce more sophisticated goods. At the same time, fast-growing medium-income or high-income countries continue to specialise more and more in highly sophisticated products.

Due to lack of data in a disaggregated level of sectors for Ukraine, the relative Theil specialisation index is estimated according to the following equation:

\[ T_i = \sum_{j=1}^{J} a_j(i) \ln \left( \frac{a_j(i)}{a_j} \right), \]

with \(0 \leq T_i \leq \ln(1/\alpha_j^*),\) \(\alpha_j^*\) as the minimum value in the range of values \(\alpha_j;\) \(i\) denotes the region, \(J\) indicates the total number of branches in which region \(i\) specialises, and \(a_j(i)\) is the share of each branch in the region. The variable is induced in the econometric model in the three broad sectors, the primary, secondary and tertiary sector, based on the assumption that the secondary and tertiary sector are characterised by higher productivity levels and returns (Nielsen 1994). The relative form of the indicator reflects the magnitude of the specialisation of a region in relation to the country. The Theil index as an entropy specialisation measure has the ability of decomposition and therefore the relative specialisation index on the primary (SPECI) and the tertiary sector (SPECIII) are included in the econometric model. As specialisation reflects the changing character of the economic structure and the productive base of each region, it is expected regions specialised on non-agricultural activities to be positively correlated with growth.

Trade openness is related to the degree of integration in an economy including more favourable terms of access to the market and the ability to develop important trade transactions. Trade openness has received persuasive intellectual support from the new theories of growth (Romer 1986, Lucas 1988, Grossman and Helpman 1991, Barro and Sala-i-Martin 1995), with the most recent ones indicating that openness leads to increased income and development levels on the sectoral and spatial level (Krugman and Venables 1996). Furthermore, a group of economists claim that trade freedom entails more benefits to the total economic development attributes in relation to the regime of protectionism and thus that the exposure of productive units to a competitive environment helps to improve productive structures, reinforcing them in the new economic environment. A series of empirical
studies provides evidence of the positive effects of this factor on economic development (Sachs and Warner 1995, Brühlhart and Sbergami 2006) or indicates it to be an important factor in market expansion (Murphy et al 1989). Conversely, a series of studies alleges that the spatial effects of trade liberalisation depends on each country’s specific geography (Brühlhart 2011) or the policy of direct trade liberalisation (especially when it has been mandated under a common framework for all countries) as it exposes less competitive and dynamic productive activities to serious risk because of their structures’ weakness to be adopted and because of competition with other powerful industries (Petrakos and Tsiapa 2009).

The variable of openness (OPEN) is included in the model estimated as the trade volume of transactions divided by the GDP of the specific region: 

$$\text{OPEN}_i = \frac{(X_i + M_i)}{GDP_i}$$

where i is the region, X the exports, M the imports and GDP the gross domestic product of each region. Its influence on growth seems to be dependent on the regional characteristics and specifically on the ability of a region to compete in the global market. Consequently, due to the spatially selective behaviour of openness on growth, it is investigated the variable alone and in interaction with the regional dummy variable of Eastern area (EAST) which includes the more advanced Eastern part of the country (following Kokko and Kravtsova (2012), the deviated in development terms Eastern area of Ukraine consists of the regions of Crimea, Dnipropetrovsk, Donetsk, Zaporizhia, Luhansk, Mykolaiv, Odessa, Kharkiv, Kherson and the city of Sevastopol).

The role of foreign direct investment in the growth process has been broadly underlined in the literature (Findlay 1978, Wang 1990, Borensztein et al 1998, Chowdhury and Mavrotas 2006). In the case of developing countries, in particular, FDI may be the main channel through which advanced technology is transferred. Additionally, it has been proved that the effect of FDI on growth is dependent on the endowments of each region (Borensztein et al 1998). More specifically for the case of Ukraine, specific studies allege for a non-important correlation of FDI with efficiency (Demchuck and Zelenyuk 2009), or for a differentiated impact of FDI on growth dependant on the local environment of each host region (Kokko and Kravtsova 2012). To this end the variable of, per capita FDI (FDI), due to its conditional effect, is included in the model.
alone and in interaction with the spatial dummy variable of Eastern area (EAST).

Finally, it is important to investigate the existence of any spatial effects of growth or, put in other words – whether the growth rate of one region depends upon that of its neighbours (Armstrong 1995). For this reason, in order to capture any growth spillover effects the variable SGR is included in the model which is estimated as: $SGR_i = \sum_{j} W_{ij} GR_j$ where $W_{ij}$ is the inverse form of the geographical distance between two regions $i$ and $j$, and $GR_j$ is the growth rate of the region $j$ (Lolos 2009). According to this, a high growth rate in a region $j$ could influence the growth of a geographically close to it region $i$. Given the gradual inter-regional integration, and intensified economic relations and linkages it is expected the estimator of the growth spillover effects to be positive. Furthermore, the development pattern of Ukraine has a clear spatial character defined by development clusters rather than by development enclaves.

The results of the econometric analysis are displayed in Table 1 for the period 2003-2009 and in Table 2 for the period 2003-2013. The changes on the development pattern of the Ukraine regions after the 2009-crisis are profound. During the period 2003-2009, economies of scale and specialisation in the tertiary sector are found to be related positively and statistically significantly with growth ascertaining the fact that when the production base of a region is related with increasing returns and/or the specialisation ability of a region relies on the more effective part of the economy (tertiary and not primary) scale economies are related expectably with higher regional growth. Furthermore, trade openness and FDI have both a negative impact on the regional growth but in the case they concern the eastern regions then this impact turned into positive. These results verify the claims that firstly, trade openness favours the more wealthy areas while it has negative effects on the regional growth of the lagging behind ones, and secondly that the contribution of FDI on growth is robust in the most vigorous (Eastern) area.

By examining the time period 2003-2013, contradictory trends in relation to the previous development pattern stand out. First, higher levels of scale economies seem to not be related with higher regional growth. Second, a greater specialisation ability in the tertiary as well as in the primary sector is associated with higher growth rates (proving the recession of the industrial Eastern area after the 2009-crisis). Finally,
trade openness and FDI have a positive (negative) and statistically significant influence on the regional growth of Western (Eastern) regions. Therefore, the crisis led to the shrinkage of ex-growing sectors (i.e. industry) or ex-growing regions (i.e. Eastern regions) bringing in front new leading sectors (i.e. agriculture) or regions (Western).

Table 1. Econometric results of the growth model (pool GLS estimation) 2003-2009

<table>
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<td>0.25***</td>
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<td>-0.20***</td>
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Note: The number of asterisks denotes the significance level of the coefficients: *** significant at the 1% level; ** significant at the 5% level; * significant at the 10% level.
Table 2. Econometric results of the growth model (pool GLS estimation) 2003-2013

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<td>-0.0008</td>
</tr>
<tr>
<td>SGR</td>
<td>0.03***</td>
<td>0.03***</td>
<td>0.02***</td>
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$R^2_{adj}$       0.51       0.59       0.54       0.57
N                  297       297       297       297

Note: The number of asterisks denotes the significance level of the coefficients: *** significant at the 1% level; ** significant at the 5% level; *significant at the 10% level

Conclusions

This paper analyses the regional dimension of development in Ukraine and investigates the determinants of regional growth in different time periods (2003-2009 and 2003-2013) in order to detect any changes in the spatial development pattern. The case of Ukraine incites the interest of a regional-level analysis due to its effort to restore its economy to post-transition levels and due to the serious spatial dichotomy which was deepen after its national autonomy (1991).

The analysis brings out two important points that characterise the spatial pattern of Ukraine: First, the spatial division into Western-Eastern area is deep, with large deviations in their economic and production structure. Furthermore, the nature of this dichotomy could not be considered in any case as one-dimensional, implying a purely economic one, as this would simply be an outcome of shallow reasoning. On the contrary, it is multi-dimensional as the spatial segregation is a result of deviated socio-political aspects and perceptions separating into tight Russian-friendly and West-European-friendly economic relations and ties.
Second, the spatial asymmetry, which is reported down to regional level (of 27 administrative districts), has been corroborated as the regional inequalities have widened. There is obvious evidence that the capital region (city of Kiev) has a dominant role as well as a perpetual attractive power in concentrating economic activities and foreign investment. This claim is in line with the Kuznets’ (1955) and Williamson’s theories (1965) which support that economic growth is associated with a sharp rise in regional inequalities at the first stages of economic development and also with several recent studies (Rodríguez-Pose 2012, Arbia et al 2011) which underline the correlation of regional disparities increase with trade openness.

Two different spatial development patterns have been revealed by the econometric analysis and the attempt to detect the drivers of regional growth in the periods 2003-2009 and 2003-2013. During the first period, internal scale economies and relative specialisation in non-agricultural sectors contribute to regional growth. Furthermore, trade openness and FDI are characterised by spatial selectiveness as they seem to favour the most developed areas. Also it is remarked that these variables characterised by a spatially conditional effect on growth are both factors of exogenous growth as they rely on a national open-door policy. Therefore, for the case of Ukraine it is also asserted that the most vigorous and advantageous regions are benefited by the global liberalisation and integration. On the contrary, the econometric analysis for the second period under review highlights a differentiated development model based on the specialisation on primary and tertiary sector, and on the trade openness and the attraction of FDI in those regions that do not experience any (industrial) recession.

Consequently, the 2009 crisis led the country in a transformational recession and a remodelling of the regional development pattern by reversing the industrialised vigorous Eastern area and of the agrarian Western area, which lagged behind the East, into respectively an industrialised stagnant area and an agrarian growing area.

The analysis also supports the existence of growth spillover effects. This signifies the fact that a high growth rate of a region might precipitate the economic growth of neighboring regions arguing for the existence of development clusters rather than of development enclaves.

The spatial heterogeneity and its eventual abatement by the stagnancy (impetus) of most (less) developed area is not an optimistic scenario. Some speculations that may arise from the analysis and concern the
policy-making field are, first, how the spatial dichotomy could be eliminated when the West-East deviations in several socio-economic aspects seem to be deeply rooted and second, how the regional disparities could be reduced when the capital region operates as the main lever of national growth reaping the most benefits from the increasing openness and integration. Answers to these issues unambiguously require further investigation. However, it might be said that the intensification of supply chains and vertical linkages among regions and enterprises could modulate the socio-economic division and enhance the entrepreneurial cooperation and productivity spillovers. Additionally, the primacy of the capital region is advantageous to growth in low-income countries; nevertheless the concentration of economic activities in only one region after a threshold is getting harmful for the economy as it leads to serious spatial asymmetries (Ezcurra 2007, Henderson 2003). To, this end and in line with the process of global integration that tends to exacerbate the regional inequalities, a regional policy agenda in both the national and supra-national level is of tremendous importance for the national and regional inclusive growth of the country.
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