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Values, Institutions and the Rise of Eastern Europe

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Abstract

We study convergence in a sample of 37 European countries to the German real GDP per capita level during the period 1999-2014 with the aim of testing whether the speed of convergence – that measures the spread of innovations across countries – is uniform or depends on the currency regime, institutions or values. The results suggest that the post-communist economies are converging more rapidly than other countries in the sample – hence leaning more rapidly from the innovations in other countries, especially those that belong to the European Union, and that controlling for the communist past, the Eurozone is converging more rapidly than the non-euro EU member countries. Moreover, we find that certain values are conducive to the catching up process and that it has generated increased job satisfaction and male labour force participation.

Keywords: Convergence, Europe, euro, values.

JEL classification: O47, O52

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We explore convergence between European countries between 1999, the year when the euro was introduced, and 2014. While much of the discussion about the economic performance of Europe has focused on the poor performance of the EU periphery in the south, we plan to study a larger set of countries in order to give a more complete account of European economic performance in recent decades. We include both member states of the European Union as well as countries outside the Union, and distinguish between members of the Eurozone and EU countries that have their own currency. Using the Nelson-Phelps (1966) framework, we estimate the speed at which the countries close the gap in terms of real GDP per capita with Germany in order to test whether the speed differs between groups of countries, in particular whether the EU member states that have their own currencies are converging faster to the German level than the euro countries. Finally we explore how job satisfaction and male labour force participation have evolved.

1. Literature

Theory would lead us to expect convergence to occur once barriers to capital mobility have been removed. In the Solow (1956) model, decreasing returns to capital and factor mobility are expected to make capital flow from higher income countries to lower income countries, permitting the latter to catch up over time. There is also the contrasting prediction coming from endogenous growth models (such as Romer, 1986; Lucas, 1988) where diminishing returns to physical capital do not occur due to learning by doing, R&D or the growth of human capital. In a seminal study that started the literature on economic convergence, Barro and Sala-i-Martin (1991) found slow absolute convergence in Europe implying that the countries were converging to the same steady state. Further evidence was provided by Barro and Sala-i-Martin (1995) who controlled for country heterogeneity. De la Fuente (2003) studied convergence in the EU and the Eurozone and found only mild evidence in favour of convergence. Crespo-Cuaresma et al. (2008) found that being an EU member state increases integration and has positive effects on convergence. Sondenmann (2014) studied productivity convergence among Eurozone countries and finds no convergence at the aggregate level. However, there is convergence in selected service sectors and manufacturing industries, which he attributes to investment in research and development as well as a high skill level of employees. Kaitila (2014) measures income convergence in Europe between 1960 and 2012. He finds that the Great Recession after 2008 reversed convergence in the EU-15 but that the post-communist economies have continued to catch up. Fritsche and Kuzin (2011) analysed

convergence within the EU and found that the results did not support the hypothesis of a two tier Europe for real GDP per capita. Instead they find evidence for three convergence clubs without strong regional linkages and that Italy and Germany are not converging to any of those clubs. Monfort et al. (2013) take into account time varying parameters in order to further explore the possibility of a two tier Europe. They find that Central and Eastern European countries are converging so that Eastern European countries plus Greece form a cluster converging to a steady state that is different from that of the others. In addition there is no clear subdivision between southern and northern countries nor between euro and non-euro countries. Finally, the Eastern European countries that belong to the Eurozone show a higher degree of convergence with the Western economies. Borsi and Metiu (2015) studied per capita real income convergence in the European Union and found no overall income convergence in the EU. Instead they identify convergence clubs formed on the basis of geographic regions and not necessarily related to EMU membership. Estrada et al. (2013) studied the convergence of unemployment, inflation, competitiveness and the current account in the euro area using the non-euro area as a control sample over the period 1999-2012 focusing on the role that sharing a common currency may have played in the evolution. They found evidence for convergence in unemployment rates across euro area countries over the first nine years of EMU but found that this trend was reversed by the time of the financial crisis. Moreover, they found evidence of convergence towards low inflation rates but that this is not confined to the euro area but can be found in a sample of the advanced economies. There were persistent differences in the current account of countries.

We extend these studies by also including post-communist Eastern European countries, both those that belong to the European Union and those that are outside the Union, and exploring both the convergence of real GDP per capita and two other measures of economic performance, which are job satisfaction and male labour force participation. Moreover, we estimate the effect of institutions and values on the speed of convergence. In this way we can test for the effect of EU membership on the speed of convergence of the poorer member states in addition to comparing the Eurozone to the rest of the EU countries.

2. Test of convergence to German output levels

We study economic growth in 37 European countries from 1999, when the euro was introduced, to 2014. We follow Nelson and Phelps (1966) and make the level of growth in a country depend on the productivity gap between the country and the leading economy, which

in the European context we take to be Germany. In the Nelson-Phelps framework, productivity growth depends on the size of the gap as well as the ability of countries to import and adopt the latest technology. We start by estimating the speed of convergence of the different country groups and testing whether they differ.

We estimate the following relationship where Y is real GDP per capita, i is the country index and G denotes Germany:

$$\log\left(\frac{Y_{i14}}{Y_{G14}}\right) - \log\left(\frac{Y_{i99}}{Y_{G99}}\right) = a_0 + a_1 \log\left(\frac{Y_{G99}}{Y_{i99}}\right) + \varepsilon_i$$

The equation shows the proportional change in the ratio of output in each of the 37 countries (Germany excluded) as a ratio to real per-capita output in Germany. Hence a positive value for the dependent variable measures the productivity gap with Germany shrinking. The right-hand side then has the relative size of the gap so that a positive number indicates a positive gap and the larger is the right-hand side variable, the larger is the gap between country i and Germany. Convergence to the German output level is then measured as a positive value of the parameter a_1 , the larger is the estimated value of this parameter the more rapid is convergence.

The table below shows the difference between each country's real GDP per capita relative to that of Germany, taken from the Penn World Table in 2011 U.S. dollars, in 1999 and 2014 and the gap bridged between these two years. Thus the first column is the right-hand side variable of the equation above and the second column is the left-hand side of the equation. The countries are ordered so that the first country, Moldova, is the one with the largest gap in 1999. We note that the top 19 countries in the table are in Eastern Europe. Only Slovenia is below these 19; that is number 22 presumably due to its proximity and close relations to Austria, Italy and Germany. At the bottom of the table we have the Nordic countries of Iceland, Norway, Sweden and Denmark, Switzerland at the very bottom with 21% higher real GDP per capita than Germany and Netherlands with 12% higher real GDP per capita than Germany. In between we have the UK and the countries of Continental Europe.

The change in the gap between 1999 and 2014 is related to its initial size. Thus the Eastern European countries at the top of the list have managed to close some of the gap with Germany. Romania, where real GDP in Germany was 152% higher than its own in 1999, managed to close the gap by 73% so that it is now only 79% higher. Other large changes occur in Lithuania which goes from 113% to 49%, Latvia where it goes from 118% to 66% and Estonia where it changes from 108% to 48%. In contrast, some of the countries at the bottom of the table see their gap turn from negative to positive as occurred in Sweden,

Denmark and Iceland. Some of the Eurozone countries are not performing well. France was 8% behind Germany in 1999 but ended up being 15% behind. Similarly, Italy was 3% behind in 1999 but ended up being 25% behind Germany in 2014. We can also see the same development in Spain, Cyprus, Greece, and Portugal.

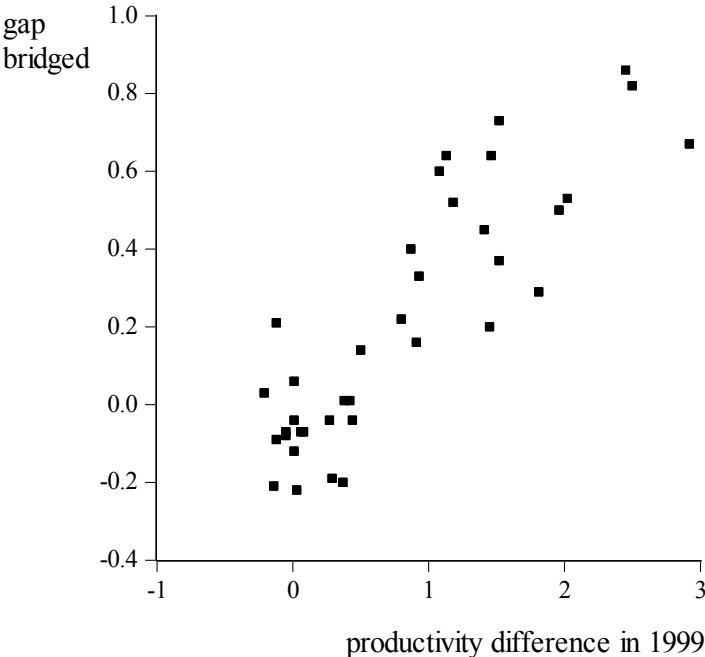
Table 1. Output per capita convergence

Country	Relative gap in 1999	Gap bridged	Relative gap in 2014
Moldova	2.92	0.67	2.26
Armenia	2.50	0.82	1.68
Georgia	2.45	0.86	1.59
Ukraine	2.02	0.53	1.49
Albania	1.96	0.50	1.46
Bosnia	1.81	0.29	1.52
Romania	1.52	0.73	0.79
Montenegro	1.52	0.37	1.15
Belarus	1.46	0.64	0.82
Macedonia	1.45	0.20	1.25
Bulgaria	1.41	0.45	0.97
Latvia	1.18	0.52	0.66
Lithuania	1.13	0.64	0.49
Estonia	1.08	0.60	0.48
Poland	0.93	0.33	0.60
Croatia	0.91	0.16	0.75
Slovakia	0.87	0.40	0.47
Hungary	0.80	0.22	0.58
Czech R.	0.50	0.14	0.37
Portugal	0.44	-0.04	0.48
Slovenia	0.42	0.01	0.41
Malta	0.38	0.01	0.37
Greece	0.37	-0.20	0.57
Cyprus	0.29	-0.19	0.47
Spain	0.27	-0.04	0.31
France	0.08	-0.07	0.15
Finland	0.06	-0.07	0.13
Italy	0.03	-0.22	0.25
Belgium	0.01	-0.04	0.05
UK	0.01	-0.12	0.13
Ireland	0.01	0.06	-0.06
Denmark	-0.05	-0.07	0.02
Sweden	-0.05	-0.08	0.03
Netherlands	-0.12	-0.09	-0.03
Norway	-0.12	0.21	-0.34
Iceland	-0.14	-0.21	0.07
Switzerland	-0.21	0.03	-0.24

Source: Penn World Table.

Figure 1 below shows the relationship between the relative size of the productivity gap closed between 1999 and 2014 and the size of the initial gap – this is the left-hand side of the equation above and the right-hand side. There is a clear upward-sloping relationship as predicted by Nelson and Phelps so that the larger the initial gap, the larger the gap that was closed. The slope depends on the ability of the countries to catch up with Germany, how fast the productivity gap is closed.

Figure 1. Growth and the productivity gap



We are interested in the slope of the relationship in Figure 1 but also in whether the slope differs between groups of countries, which would imply that some find it easier to adopt foreign innovations than others. We will explore the role of institutions – whether the countries are members of the European Union, whether they have the euro or their own currencies and whether they are former communist societies as shown in Table A1 in the appendix – the initial level of real GDP per capita as a measure of the cost of production, and values.

We first estimate the equation without taking into account institutions, values or the initial level of GDP per capita in column (1) for the period 1999-2014 and in column (4) for the period 1999-2007, leaving out the years 2008-2014 when the financial crisis hit many of these countries, especially the southern periphery. The estimated coefficient of the productivity gap

is 0.33 for the whole sample period and 0.18 for the 1999-2007 period. This implies that on average 33% of the output gap with Germany is closed over these 15 years. The estimation results show convergence to the German output per capita level, confirming the visual impression in Figure 1, although there are exceptions such as Italy as can be seen in Table 1.

Table 2. Equation (1) estimated

Dependent variable: $\frac{Y_{i14}/Y_{G14} - Y_{i99}/Y_{G99}}{Y_{i99}/Y_{G99}}$						
	1999-2014			1999-2007		
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	-0.05 (1.54)	-0.09 (.78)	0.01 (0.07)	0.06* (2.47)	0.02 (0.26)	0.10 (0.97)
log(Y _{G99} /Y _{i99})	0.33* (10.30)	0.24* (4.92)	-0.09 (0.76)	0.18* (5.74)	0.14* (3.23)	-0.09 (1.02)
d_comm		0.22* (3.13)	-0.08 (0.67)		0.11** (1.96)	-0.11 (1.08)
d_EU		0.02 (0.16)	-0.06 (0.37)		-0.01 (0.07)	-0.07 (0.64)
d_euro		-0.01 (0.25)	-0.07 (1.44)		0.05 (1.26)	0.01 (0.27)
d_comm* log(Y _{G99} /Y _{i99})			0.40* (3.09)			0.29* (2.51)
d_EU* log(Y _{G99} /Y _{i99})			0.18* (1.75)**			0.14* (2.11)
d_euro* log(Y _{G99} /Y _{i99})			0.16 (2.22)*			0.11 (1.84)**
Observations	37	37	37	37	37	37
R-squared	0.75	0.81	0.87	0.59	0.64	0.72
S.E.	0.16	0.15	0.13	0.13	0.13	0.12
F-statistic	104.00	35.03	28.87	50.97	13.96	10.58

t-statistics are in parentheses. Method: White-heteroscedasticity least squares. * denotes significance at the 10% level. ** denotes significance at the 10% level.

2.1 Institutions

In columns (2) and (3) we take into account differences in institutions by adding dummy variables for three groups, which are the post-communist countries, the European Union countries and the Eurozone countries in column (2) and then interact the dummy variables with the output gap variable in column (3).¹

When we add dummy variables for the post-communist countries, the EU countries and the Eurozone we find that it is the growth rate in the first group that accounts for a significant

¹ We do not distinguish between countries that were EU members in 1999 and those who joined later nor between euro zone countries that adopted the euro in 1999 or later.

proportion of the convergence since it is the only dummy variable with a positive and significant coefficient.

When the interaction terms between the dummy variables and the output gap variable are added in column (3), all constant terms become statistically insignificant while the coefficients of the interaction terms are significant. The results tell us that it is the post-communist economies that converge fastest to the German level of output, followed by the Eurozone economies. Changing the sample to 1999-2007 does not change the results qualitatively. Note that the only countries that do not fall into one of the three groups are Iceland, Norway and Switzerland, which are at the bottom of Table 1, starting with a higher level of real GDP per capita than Germany. Of the three, Norway pulls further ahead of Germany during this period and Switzerland slightly while Iceland falls behind. This development is captured by the negative coefficient of the output gap in Table 2 when the interaction terms are included. Since the output gap is negative for these countries, a negative coefficient implies that the three countries were on average pulling further ahead, although only slightly.

Two observations can be made about the results on the results in Table 2. First, the speed of convergence is not the same for the different groups of countries. The post-communist economies appear to converge faster than the other countries in our sample. The hypothesis that the post-communist countries converge at the same rate as the EU countries can be rejected at the 10% level ($F=3.48$). Also, the t-statistic for the post-communist countries suggests that they are converging in a different way from the reference group. The estimates of the coefficients of the output gap indicate a speed of convergence of 0.58 (0.40+0.18) for the post-communist countries that belong to the EU, a speed of 0.34 (0.18+0.16) for the Eurozone countries and a speed of 0.40 for post-communist countries that are not a part of the EU. Hence it follows that EU membership appears to have benefited the post-communist countries since the post-communist countries that are also members of the EU converge even more rapidly. It is thus not the difference between using the euro and having an independent currency within the EU that separated countries that grow fast from those that grow slowly but whether they start from a low base as post-communist economies and underwent structural changes and foreign investment.

So what then can explain the good performance of the Eastern European economies? The answer may lie in the structural transformation from communism to capitalism, foreign direct investment, and the inflow of EU structural funds. In essence the Central and Eastern European economies have accomplished financial and trade integration with the rest of the

European Union. This explains why the post-communist countries that are member states of the EU, hence part of the Single Market, do even better than those that are not member states.

The car industry is a good example of foreign direct investment. European and Japanese companies have set up factories throughout Central and Eastern Europe in order to take advantage of the lower cost of production and access to the Single Market. The transformation of the Skoda factories in the Czech Republic from producing inefficient low-quality cars during communism to be part of the Volkswagen group producing high quality cars is a manifestation of the importation of foreign technologies through foreign direct investment. A similar development occurred in Romania where Renault-Nissan took over the formerly state-owned Dacia car manufacturing company. Dacia is now among the largest industrial firms in Romania and Romania's largest exporter.² Other companies, such as Fiat and Peugeot Citroen opened up factories in Eastern Europe and Jaguar Land Rover has started production in Slovakia, to name just a few examples. In the decade to 2010, European brands opened a third of all their new automobile factories in Central and Eastern European countries. Thus since the financial crisis in 2008, Slovakia, the Czech Republic and Romania are the only countries in the EU, apart from the UK, with rising car production.³

Popescu (2014) discusses the role of inward FDI in Eastern European countries. He describes how FDI reinforces insufficient domestic funds to finance the change of ownership of existing companies and generating new technology, managerial know-how and skills required when companies are restructured. This author argues that a stable macroeconomic environment determines the FDI inflows. Multinational firms are also attracted by low costs to invest in these economies. The impact of the FDI on domestic productivity is greater when the initial level of productivity is lower. The investing firms tend to acquire capital in the capital markets of their home countries and they have created producer-driven networks in the manufacturing sector. Popescu cites a report by Ernst & Young from 2014 as listing the most attractive host countries to be Poland, the Czech Republic, Romania, Hungary, the Ukraine, Latvia and Slovakia based on economic freedom, trade openness and institutions.

In order to explore these relationships in our data we let the coefficient a_1 in the equation above depend on the level of real GDP in 1999 as well as *the Heritage index of economic freedom*. While the latter coefficient – that is of the interaction of the output gap and the freedom index – was insignificant, we found that the squared value of 1999 output has a

² See Kester Eddy, "Spar parts are now essential component of Romania's economy," *Financial Times*, November 17, 2015.

³ See Henry Foy, "Carmakers drive across central Eastern Europe's frontiers," *Financial Times*, November 17, 2015.

significant and negative coefficient as shown in column (1) in the extension of Table 2 below. The results suggest a non-linear relationship between real GDP per capita in 1999 and the speed at which the output gap is closed so that the lower is initial output, the faster is the speed of convergence. This supports the hypothesis that foreign investment flows into the poorest, that is the lowest cost, countries.

The region has also been helped by structural funds coming from the European Union. On average central and Eastern European countries received structural funds that amounted to 14.8% of GDP between 2007 and 2014. Thus the Czech Republic received 15.9% of GDP, Estonia 16.6%, Hungary 22.9% and Lithuania 18.2%.⁴ This has improved the countries' infrastructure by financing new bridges, highways, train terminals, research and development and environmental protection.

The rapid pace of foreign direct investment, the reorganisation of industry and the economy taking advantage of the efficiency gains of capitalism can explain the higher value of a_1 , the coefficient of the productivity gap, in the equation in Section 2 above. But note that the constant term in the equation is not lower for the post-communist countries, which implies that these countries did not converge to a lower output level

2.2 Values

Another possible reason for the fast growth of the post-communist economies is that they have better work ethics and values. This could also explain why some of them are doing better than others. Based on Phelps and Zoega (2017) we take four questions from the *European Values Study* in 1999. The first one asks if it is important to teach children to be *obedient*, as opposed to independent.⁵ This question is meant to measure traditional values. The second asks whether responders think it is important to them to be able to *achieve on the job* and the third asks whether it is important to be able to *take the initiative on the job*. The final question is whether *competition is good for people*.⁶ By adding these variables the

⁴ KPMG, *EU Funds in Central and Eastern Europe: Progress Report 2007-2015*, <https://assets.kpmg.com/content/dam/kpmg/pdf/2016/06/EU-Funds-in-Central-and-Eastern-Europe.pdf>.

⁵ Tabellini (21010) found this variable to be significant in explaining differences in output per capita between regions in Europe.

⁶ Learn children at home: obedience (Q49K); Important in a job: achieving something (Q13L); Important in a job: use initiative (Q13H); competition good vs. harmful for people (Q54C). In the first three case the proportion of respondents who said yes to the three questions is used in the regression, measured in percentages. Attitudes towards competition are measured on the 0-10 scale and the number used is the difference between those most in favour of competition and those who are most against it.

number of observations falls from 37 to 25, which reduces the degrees of freedom and the statistical significance of the coefficients.⁷

We first add the obedience variable in levels and interacting with the output gap variable. While the variable in levels has a statistically insignificant coefficient, the interaction term has a significant negative coefficient, which implies that the higher is the proportion of parents who want their children to be obedient the slower is the speed at which the country catches up with Germany. In column (3) we drop the insignificant level of the obedience variable and add the desire to achieve variable in levels and interacting with the output gap. Both terms turn out to be insignificant. We then add the desire to show the initiative in levels and interacting with the output gap. The two coefficients are more significant but still fail at the 5% level. The sign of the coefficients implies that the greater the desire to take the initiative, the faster is the speed of adjustment. Finally, we add the competition variable in levels and interacting with the output gap and then in (6) drop the level term. We find that a positive attitude towards competition increases the speed of convergence.

We note that in columns (4)-(6) the coefficient of the interaction of the post-communist dummy and the output gap remains statistically significant and positive and the coefficient of the interaction of the squared value of real GDP per capita and the output gap, is negative and significant as well as the coefficient of the interaction of the obedience variable and the output gap. The estimated values of the coefficients of the interaction of the EU dummy and the output gap and the euro dummy and the output gap are similar to the previous columns but their statistical significance falls below the 5% level.

Table 2 extended

⁷ The countries included are Belarus, Belgium, Bulgaria, Croatia, the Czech Republic, Estonia, Denmark, Finland, France, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, the UK and Ukraine.

Dependent variable: $\frac{Y_{i14}/Y_{G14} - Y_{i99}/Y_{G99}}{Y_{i99}/Y_{G99}}$						
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	-0.04 (0.28)	-0.10 (0.75)	0.02 (0.17)	0.09 (0.83)	0.13 (1.08)	0.13 (1.17)
log(Y _{G99} /Y _{i99})	-0.002 (0.02)	0.43* (3.73)	0.34* (2.33)	0.27** (1.82)	0.18 (1.22)	0.19 (1.35)
d_comm	0.03 (0.20)					
d_EU	-0.04 (0.23)					
d_euro	-0.01 (0.31)					
d_comm* log(Y _{G99} /Y _{i99})	0.30* (2.09)	0.16* (2.06)	0.19* (2.23)	0.16* (2.06)	0.19* (2.12)	0.19* (2.34)
d_EU* log(Y _{G99} /Y _{i99})	0.18* (1.70)	0.11* (2.27)	0.12 (1.52)	0.08 (1.28)	-0.06 (0.56)	-0.06 (0.60)
d_euro* log(Y _{G99} /Y _{i99})	0.10 (1.31)*	0.08 (1.53)	0.05 (0.71)	0.11 (1.61)	0.19 (1.74)	0.19** (1.93)
Y _{i99} ² * log(Y _{G99} /Y _{i99})	-0.03* (2.04)	-0.05 (1.67)	-0.004 (1.77)	-0.006* (3.59)	-0.005* (2.26)	-0.005* (2.26)
obedience		-0.001 (0.25)				
obedience* log(Y _{G99} /Y _{i99})		-0.005** (1.95)	-0.005* (2.82)	-0.006* (3.59)	-0.006* (3.18)	-0.006* (3.28)
achieve			-0.002 (1.12)			
achieve* log(Y _{G99} /Y _{i99})			0.001 (0.27)			
initiative				-0.004 (1.65)	-0.005** (1.83)	-0.005** (1.90)
initiative* log(Y _{G99} /Y _{i99})				0.005 (1.24)	0.07 (1.69)	0.007 (1.72)
competition					0.000 (0.03)	
competition* log(Y _{G99} /Y _{i99})					0.02 (1.28)	0.02** (1.78)
Observations	37	25	25	25	25	25
R-squared	0.88	0.93	0.94	0.94	0.95	0.95
S.E.	0.13	0.10	0.14	0.09	0.09	0.09
F-statistic	25.96	34.30	30.77	31.57	25.88	30.80

t-statistics are in parentheses. Method: White-heteroscedasticity least squares.* denotes significance at the 10% level. ** denotes significance at the 10% level.

2.3 Summary of results

We have found that the speed of convergence depends not only on the output gap but also that the coefficient of the output gap in the Nelson-Phelps equation, which differs between countries depending on institutions, the level of real GDP per capita in 1999 and values. In particular, we find that the post-communist countries, especially those that belong to the EU, converge faster to the German output per capita level. Also, the lower is the initial level of real output per capita the faster is the speed of convergence, which can capture the incentive by businesses in the West to invest in poor, low-cost countries in Eastern Europe. Finally, values may matter so that if parents want to teach their children to be obedient, instead of independent, the speed of convergence is smaller; desiring to take the initiative in the workplace increases the speed of convergence; and accepting competition also increases the speed of convergence.

2.4 Job satisfaction and labour force participation

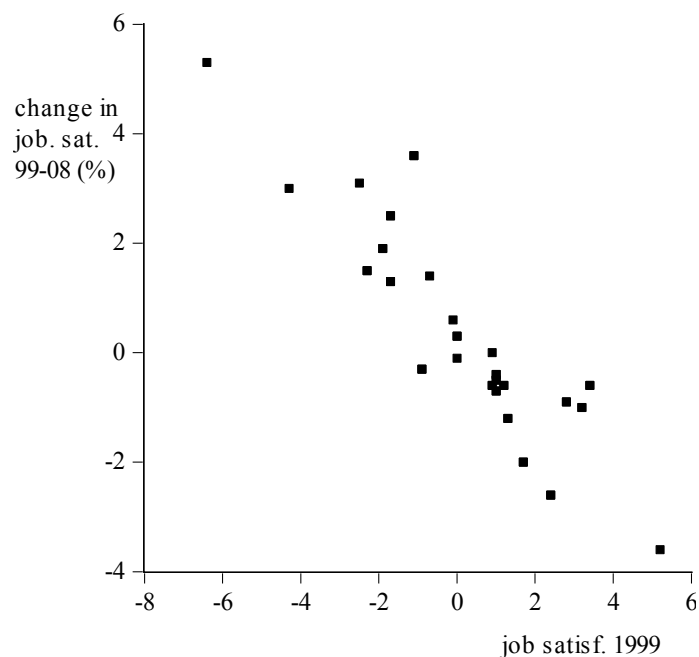
We have shown that institutions and values may have contributed to the convergence of output per capita in Europe since 1999. Higher output brings greater consumption and welfare but it is also of some interest whether male labour force participation and job satisfaction in Europe has also converged. This would measure to what extent jobs have become more attractive and rewarding in the fast-growing economies.

In Figure 3 below we measure job satisfaction as the difference between those who are satisfied and those that are dissatisfied (the two extreme values on the 0-10 scale) and plot the change in this variable from 1999 to 2008 against its initial value in 1999 for 26 countries.^{8,9} The figure shows that there has been convergence in job satisfaction also. In particular, the Eastern European countries start up with low jobs satisfaction and then catch up with the rest of the countries during this period. We can conclude from this that economic growth has coincided with greater job satisfaction as well as higher levels of output and consumption.

⁸ The 2008 is the last wave of the European Values Study.

⁹ The countries are Belarus, Bulgaria, Croatia, the Czech Republic, Estonia, Denmark, Finland, France, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, the UK and Ukraine. Source: European Values Study.

Figure 3. Convergence in job satisfaction

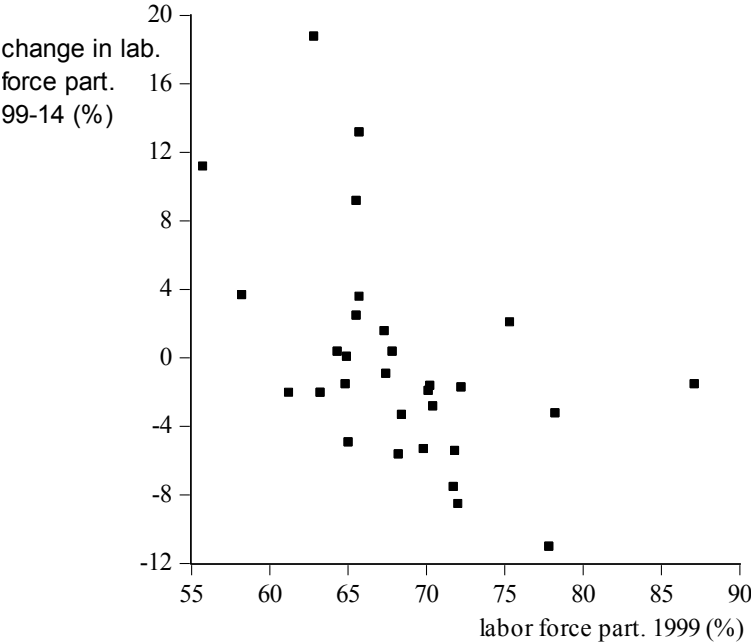


In Figure 4 we show the relationship between changes in male labour force participation and its initial level in 1999. There is also convergence in this variable over the period, which implies that more rewarding jobs have attracted more men into the labour force in the fast-growing countries of Eastern Europe.¹⁰

We have found that the fast growing economies of Eastern Europe have also generated more attractive jobs with increased job satisfaction and increased male labour force participation. We now turn to estimating changes in the distribution of the level and growth of real GDP per capita.

¹⁰ The countries included are Albania, Belarus, Belgium, the Czech Republic, Estonia, Denmark, Finland, France, Georgia, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Macedonia, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, UK and Ukraine. Source: World Bank.

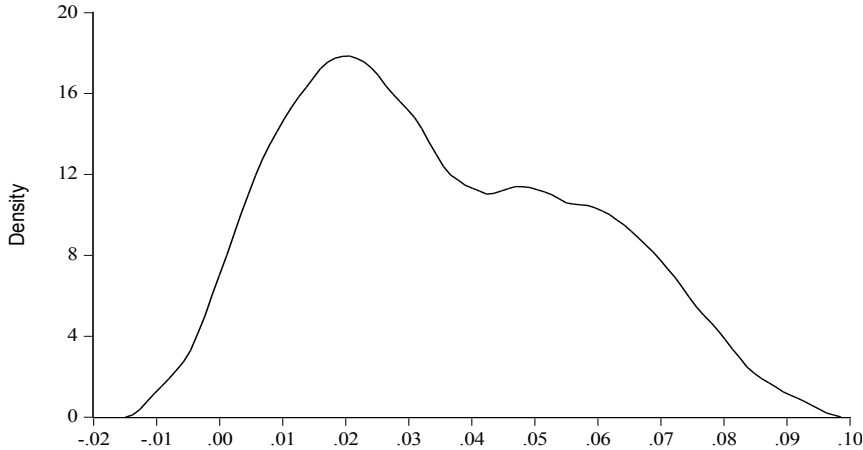
Figure 4. Convergence in male labour force participation



3. Distributions

Figure 5 below show the distribution of the average rate of growth of real GDP per capita for the group of 37 countries (Germany excluded) from 1999-2014. We note the two modes in the figure where the right-hand modes shows the fast-growing countries in Eastern Europe that we found in the upper half of Table 1.

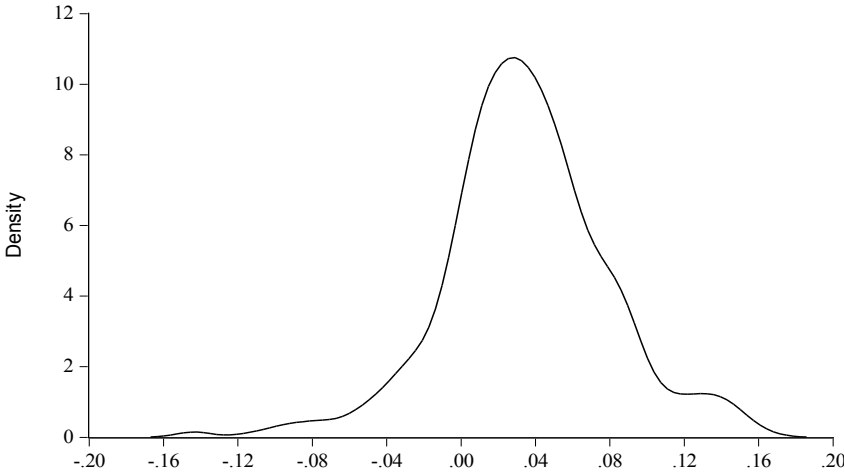
Figure 5. Distribution of average growth rates of GDP from 1999-2014



Kernel density estimation with normal kernels.

Figure 6 has the distribution of the annual growth rates for the 37 countries for the whole sample period, which generates 555 observations.

Figure 6. Distribution of annual growth rates of GDP from 1999-2014

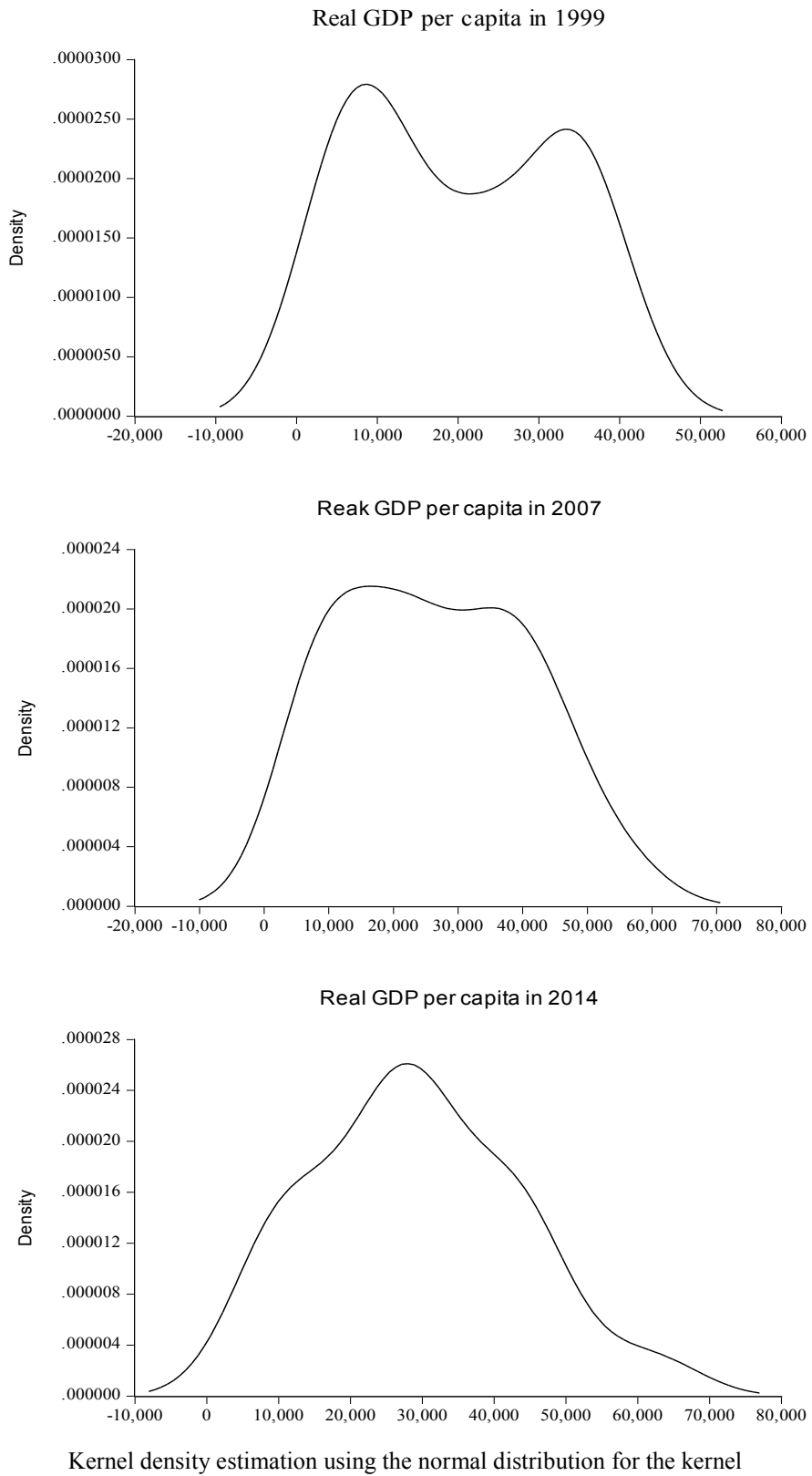


Kernel density estimation with normal kernels.

Here we see many very negative growth rates because the period spans the years of the Great recession. But there are also some impressively positive rates, which are found in the countries of Eastern Europe. The hump in the right-hand tale is also visible in this figure.

Figure 7 below shows the distribution of real GDP per capita at the beginning of the sample period in 1999, then in 2007 and finally in 2014. In 1999 there are two modes in the distribution – indicating the presence of two densities – with a split between the two at 20 thousand dollars per capita. By 2007 the two densities have almost merged although a slight dip around 35 thousand dollars can still be seen. Finally in 2014 there is only one density with a peak around 32 thousand dollars. We also note that the right-hand tail goes from being slightly in excess of 50 thousand dollars in 1999 to 70 thousand dollars in 2007 and close to 80 thousand dollars in 2014.

Figure 7. Densities for real GDP per capita



The density to the left in the top figure – corresponding to the first mode in the figure – shows the density for the Eastern European economies. The catch-up that we have detected and manifested itself in the faster growth of the post-communist economies between 1999 and 2014 then makes this density move rightward towards higher GDP per capita levels and merge with the density for the rest of the European countries. Thus the poorest country in 1999 was Moldova, followed by Armenia, Georgia, the Ukraine, Albania, Bosnia, Romania, Montenegro and Belarus. The most affluent country in this group in 1999 was the Czech Republic. The richer group of countries starts with the poorest member Portugal, then there is Slovenia, Malta and Greece. The richest countries are Switzerland, Iceland, Norway and the Netherlands. In 2014, the poorest country remains Moldova, followed by Armenia, Georgia, Bosnia and the Ukraine. But what has changed is that some of the Eastern European economies now have higher real GDP per capita than some Western European countries. Thus the Czech Republic is not far from Spain and has pulled ahead of Malta, Cyprus, Portugal and Greece. Other good performers are Slovenia, Slovakia and Estonia that also have higher output than Portugal and Greece.

While the Eastern European economies are catching up with Germany, many of the Western European ones are falling behind. This applies to the periphery hit by the financial crisis – Greece, Iceland, Portugal and Spain – but also to Italy that is 25% behind Germany in real GDP per capita in 2014 but was only 3% behind in 1999. Several other countries also fell behind Germany; The Netherlands, Denmark, Sweden, Belgium, Finland, the UK and France. In contrast, Switzerland and Norway pull further ahead of Germany.

4. Conclusions

In this paper we have modelled convergence to the German level of real GDP per capita for 37 European countries over the period 1999-2014. The results can be summarised as finding that while most of Western Europe has lagged behind, Central and Eastern Europe have managed to narrow the gap with Germany, especially those belonging to the European Union. As a result the density of real GDP per capita has changed from being bimodal in 1999 – indicating two densities, one for the poorer countries and one for the richer European countries – to having one mode – indicating one common density. At the same time job satisfaction in Eastern Europe has increased and, perhaps as a result, so has male labour force participation.

We trace the growth to differences in institutions and values. The fast growing countries tend to value taking the initiative at work, they are accepting of competition and have a small

proportion of parents who would like to teach their children to be obedient as opposed to independent. The institutional background also matters with the post-communist members of the European Union growing the fastest. We also find that the lower is the initial level of GDP, the faster the rate at which the productivity gap is closed. This indicates that companies in Western Europe are investing in low-cost Eastern European countries.

Output growth in the east that stems from foreign direct investment by companies in Western Europe contributes to GDP in Eastern Europe. This investment involves the transfer of capital and innovations from Western Europe to Central and Eastern Europe. The positive effect of EU membership on the rate of convergence of post-communist economies to the German level of output per capita shows that membership of the Single Market as well as access to structural funds has helped growth in these countries. However, the relocation of production from the west to the east may have the effect of lowering measured economic growth in the west when GDP is used since retained profits are only a part of the value added in foreign subsidiaries. It follows from our observation of convergence in output when GDP is used as an output measure that the economic performance of Europe as a whole may be better than what is commonly found when focusing on individual Western European countries.

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Table A1. Classification of countries

Country	Former communist state	Membership of EU	Currency
Albania	YES	NO	Lek
Armenia	YES	NO	Dram
Belarus	YES	NO	Bel. Ruble
Belgium	NO	YES	Euro
Bosnia	YES	NO	Convertible marks
Bulgaria	YES	YES	Bulgarian Lev
Croatia	YES	YES	Croatian Kuna
Cyprus	NO	YES	Euro
Czech R.	YES	YES	Czecg Jiryba
Denmark	NO	YES	Krona
Estonia	YES	YES	Euro
Finland	NO	YES	Euro
France	NO	YES	Euro
Georgia	YES	NO	Lari
Greece	NO	YES	Euro
Hungary	YES	YES	Forint
Iceland	NO	NO	Krona
Ireland	NO	YES	Euro
Italy	NO	YES	Euro
Latvia	YES	YES	Euro
Lithuania	YES	YES	Euro
Macedonia	YES	NO	Denar
Malta	NO	YES	Euro
Moldova	YES	NO	Moldovan Leu
Montenegro	YES	NO	Euro
Netherlands	NO	YES	Euro
Norway	NO	NO	Krona
Poland	YES	YES	Zloty
Portugal	NO	YES	Euro
Romania	YES	YES	New Leu
Slovakia	YES	YES	Euro
Slovenia	YES	YES	Euro
Spain	NO	YES	Euro
Sweden	NO	YES	Krona
Switzerland	NO	NO	Swiss Franc
UK	NO	YES	Pound Sterling
Ukraine	YES	NO	Hryvnia