

Stochastic convergence in real personal disposable income in the EU: a note

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Abstract

Economic convergence has long been a declared objective of the EU and has been considered the fundamental mechanism for achieving socio-economic cohesion. Even so, the empirical literature finds a lack of real convergence as geographical clusters have emerged. In this paper we contribute to the literature on income convergence in the EU by analysing convergence in real disposable income across European countries. In contrast to the previous results on real convergence in the EU, we find that most of the countries are converging to the same equilibrium level.

Key words: Convergence, Europe, disposable income, cluster.

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1. Introduction

The neoclassical growth models originally set out by Solow (1956) and Swan (1956) predict per capita income convergence. In this theoretical framework, convergence occurs when poor countries grow faster than relatively richer ones so that they catch up with them.

Bénabou (1996) points out that the neoclassical growth model predicts convergence in income per capita not just in the first moment, the mean, but also in higher moments, such as the variance. According to this author, “Once augmented with idiosyncratic shocks, most versions of the neoclassical growth model imply convergence in distribution: countries with the same fundamentals should tend towards the same invariant distribution of wealth and pretax income.” (Bénabou 1996, p. 51). This means that the neoclassical growth models predict convergence not only in income per capita but also in income inequality. Quah (1996) explores the link between convergence in income per capita and income distribution, and concludes that the prediction of convergence made by the neoclassical growth model holds when (a) poor economies grow faster than rich ones (growth mechanism) and (b) within country income inequality falls in countries with initially high inequality (convergence mechanism). Importantly, as pointed out by Quah (1996, 2), ‘the two mechanisms – pushing back and catching up – are related, but logically distinct: one can occur without the other.’ This means that although similar convergence patterns can be observed in income per capita and inequality across economies, it is not possible to infer any causal link between these two processes.

Convergence has been always an explicit objective of the EU, as formulated in Article 130a of the Single European Act in 1986, as it provides a mechanism for achieving economic and social cohesion between countries. Policies that aimed to promote economic convergence were set out in 1975 through the Structural Funds, and later in 1993 through the Cohesion Funds.

Despite these efforts, the empirical literature still finds a lack of real convergence between EU countries. Monfort et al (2013) conclude that the EU-14 member states have converged to different steady states in terms of economic efficiency as measured by labour productivity. Similarly Ordóñez et al (2015) conclude that after years of ever-closer economic integration, EU countries have converged to different steady states in competitiveness measured as real unit labour costs and in capital accumulation and total factor productivity as the drivers of growth. According to Monfort et al (2018), this lack of real economic convergence is also present in inequality and unemployment. Alcidi et al (2018) conclude that income convergence in real GDP per capita in the EU is a tale in two parts, with large internal diverging patterns that translate to the emergence of geographical clusters.¹

Monfort, et al (2018) provides an insightful explanation of the reasons why economic integration in the EU has not been translated to overall real economic convergence. As pointed out by these authors, in a neoclassical world with rational agents, perfect information, perfect competition, and full mobility of production factors, economic integration should lead to economic convergence. Although the European integration process has continuously trying to make progress in these dimensions by enhancing transparency, competition, and factor mobility, there are three potential channels for

¹ See also Cunado and Perez de Gracia (2006), Cunado et al. (2007) and Astrid et al. (2013) for developing countries.

divergence. First, the existence of real economic divergence is related to the impact of economic integration in terms of macroeconomic governance. According to Croci and Farina (2012), the macroeconomic governance of the EU, and in particular the Euro zone, far from promoting real convergence has magnified and mutually reinforced imbalances, exacerbating real divergences through endogenous asymmetric shocks (De Grauwe and Ji, 2013). Also, the lack of reform in national markets, its different speed, and the varying scope of such reforms could explain the existence of divergences between Eurozone countries. Second, divergence can also be the result of new mechanism that arise from the interaction of markets at a microeconomic level. Greater integration may lead to activity specialization and economic agglomeration (Krugman, 1991) and, in turn, differential growth across countries, with affect income distribution and intensify inequalities between countries. Furthermore, greater specialization can also increase vulnerability to asymmetric shocks (Midelfart et al, 2003). Third, divergence can be also be explained by changes in the public redistributive capacity. Economic integration can put in place new sources of inequalities that will require the implementation of new redistribution policies not included in the traditional welfare state to offset the negative effects of market deregulation and greater factor mobility and competitiveness. Also, Broader markets improve efficiency because they provide individuals with a wider range of choices, but at the same time, they make it more difficult to implement redistribution policies (Agell, 2002).

In this paper we seek to contribute to the literature on real convergence in the EU by analysing convergence in real personal disposable income. We evaluate the existence of clusters by applying the methodology proposed by Phillips and Sul (2007, 2009) in which different paths of convergence can be distinguished among the various

heterogeneous economies involved in a convergence process. This heterogeneity is modelled through a nonlinear time-varying factor model, which provides flexibility in studying idiosyncratic behaviours over time and in cross-section.

Our results suggest that there is no evidence of real convergence in real personal disposable income across European countries. On the contrary, we see a variety of clusters emerge so that Europe is divided into groups with different characteristics.

The remainder of the paper is organised as follows. The next section summarises the methodology. Section 3 describes the data and results, and the last section concludes.

2. Methodology

The time-series approach to the study of convergence can be found in the seminal papers by Carlino and Mills (1993) and Bernard and Durlauf (1995, 1996). These authors developed the concept of stochastic convergence, basing it on the stationarity properties of the variables under analysis. However, as pointed out by Phillips and Sul (2009), traditional convergence tests are not appropriate when the speed of convergence is time-varying. To account for temporal transitional heterogeneity, Phillips and Sul (2007, 2009) introduced cross-sectional and time-series heterogeneity.

The starting point of the test is a simple factor model $X_{it} = \delta_{it}\mu_t$ where δ_{it} is a time-varying factor-loading coefficient and measures the idiosyncratic distance between some common factor μ_t and the systematic part of X_{it} . The null hypothesis of convergence is $H_0: \delta_i = \delta$ for all i , and can be tested against the alternative of divergence or cluster convergence by means of the ‘log t’ regression model:

$$\log(H_1/H_t) - 2\log L(t) = \hat{c} + \hat{b}\log t + u_t \quad (1)$$

for $t=[rT], [rT]+1, \dots, T$ with an $r > 0$, and $\log(H_1 | H_t)$ is the cross-sectional mean square transition differential and measures the distance of the panel from the common limit.

The convergence approach by Phillips and Sul (2007, 2009) presents clear benefits. First, it is a test for relative convergence as it measures convergence to some cross-sectional average in contrast to the concept of level convergence analysed by Bernard and Durlauf (1996). Second, this approach outperforms the standard panel unit root tests since they may classify the difference between gradually converging series as non-stationary. In contrast, the Phillips and Sul (2007, 2009) test does not depend on any particular assumption about the trend stationarity or stochastic non-stationarity of the variables to be tested.

3. Data and results

Data on real personal disposable income have been taken from Mack and Martínez-García (2011)². The sample is 1975:Q1 to 2019:Q2 and contains Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Norway, Spain, Sweden, Switzerland³ and the United Kingdom.

Figure 1 plots the transition paths and shows the time path behaviour of each series relative to the average panel, which takes the value of 100. A downwards move in

² The authors would like to thank Mack and Martínez-García (2011) for the use of their dataset. The data and details are available from: <https://www.dallasfed.org/institute/houseprice/>.

³ Norway and Switzerland are not EU members, though Norway is in the EEA. These countries are included as controls. The results in terms of the number and composition of clusters do not change when these countries are excluded from the sample.

the transition path for a given country cannot be interpreted as a fall in absolute real personal disposable income, but rather as a fall relative to the behaviour of the whole panel. That makes this graph a useful way to gauge the degree of convergence among countries and to determine when, and for how long, this convergence takes place. Leaving aside Luxembourg, the graph suggests that there are two distinct groups of countries that seem to converge to different equilibrium levels. One group contains Norway, the UK, Finland and Ireland, while the other contains the rest of the countries. Norway and the UK, two non-euro countries, appear to diverge from the rest of the panel from the early 1990s onwards, showing persistence above the mean for real personal disposable income. Ireland and Finland, two euro area countries, diverged from the beginning of the 2000s. The rest of the countries share a convergence path and a clear narrowing in their real personal disposable incomes up to 2010, when the difference in this variable appears to be wider than it was before the crisis.

Table 1 presents the results for the cluster convergence analysis. Overall convergence can be rejected in favour of club convergence, with three clusters. The composition of the clusters corroborates our findings about the transition paths. Given that the clustering procedure tends to find more groups than may actually exist we have tested whether adjacent clubs can be merged into larger groups. Table 2 shows the results, which indicate that the first two clusters can be merged. The final composition of clusters is shown in Table 3.

Figure 1 plots the transition paths, which shows the time path behavior of each series relative to the average panel, which takes a value of 100. A decrease in the transition path for a given country cannot be interpreted as a decrease in absolute real personal disposable income, but rather as a decrease relative to the behavior of the whole

panel. Therefore, this graph is a useful way to gauge the degree of convergence among countries and to determine when, and for how long, this convergence takes place. Leaving aside Luxembourg, the graph suggests that there are two distinct group of countries which seem to convergence to a different equilibrium levels: Norway, UK, Finland, and Ireland, on one hand, and the rest of the countries on the other. Norway and the UK, two non-euro countries, appear to diverge from the rest of the panel from the early 90s onwards, showing persistence above the mean real personal disposable income. Ireland and Finland, two Eurozone countries, diverged from the beginning of the 2000s. The rest of the countries share a convergence path and a clear narrowing in their real personal disposable incomes up to 2010, when the difference in this variable appears to be wider compare to the pre-crisis period.

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⁴ The test for overall convergence is rejected with a *logt* coefficient of -0.81 and a t-statistic of -79.16

4. Conclusion

In this paper we analyse cluster convergence in real personal disposable income in the EU. In contrast to previous results on real convergence in the EU, we find that most of the countries are converging to the same equilibrium level. Neither membership of the EU nor of the euro area seems to play a determining role in the composition of clusters, as Norway and the UK converge with Finland and Ireland, while Switzerland converges with the rest of the euro area countries. It seems that the economic integration process has overall favoured convergence in real personal disposable income, although this convergence is not confined to the EU member states.

Data statement

Data on real personal disposable income have been taken from Mack and Martínez-García (2011). The data and details are available from: <https://www.dallasfed.org/institute/houseprice/>.

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Figure 1: Transition functions (1975:Q1- 2019:Q2)

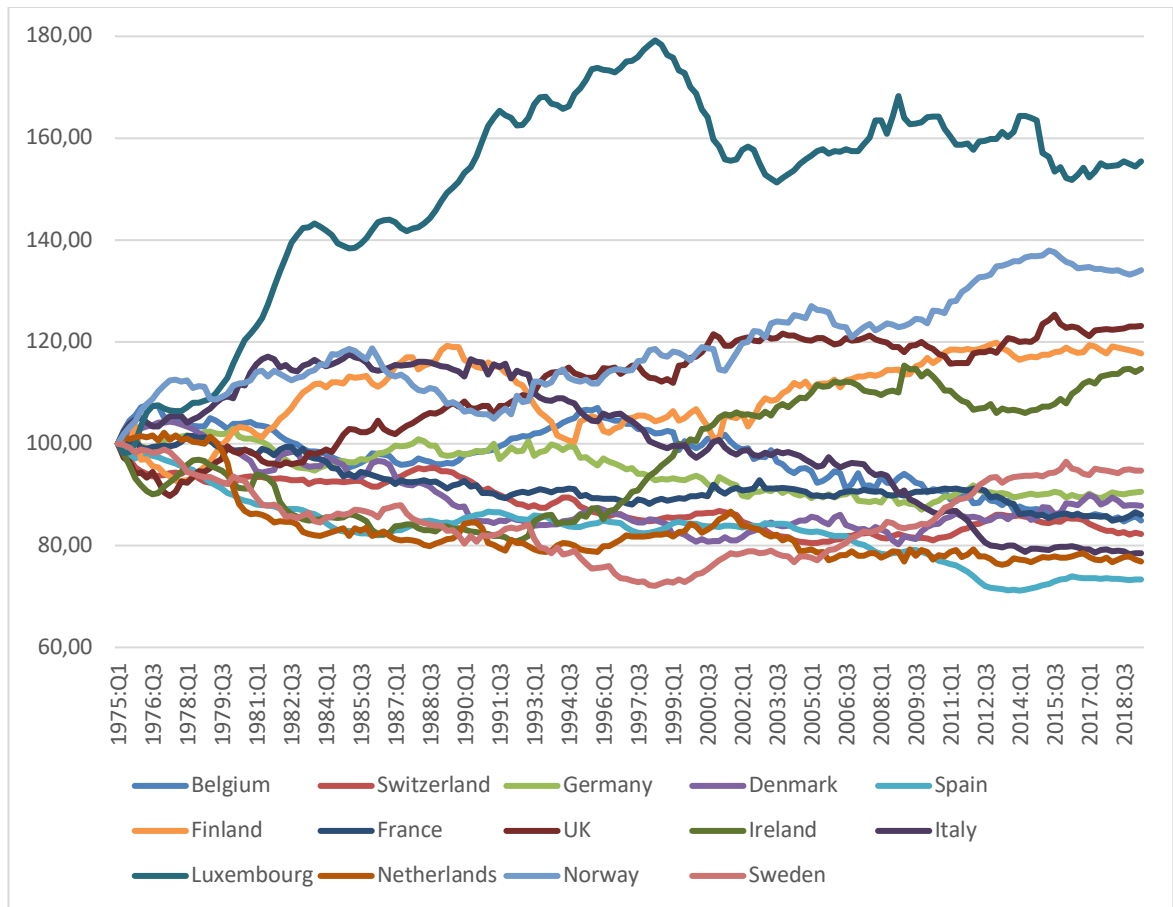


Table 1: Real personal disposable income cluster analysis (1975Q1-2019Q2)

Log t	t statistic	Cluster
-0.831	-1.341	Luxembourg and Norway
0.551	0.958	Finland, Ireland, and the UK
-0.248	-1.140	Belgium, Denmark, France, Germany, Italy, Netherlands, Spain, Sweden, and Switzerland

Table 2: Testing for cluster merging (1975Q1-2019Q2)

Cluster	Log t	t statistic
Clubs 1 +2	-0.297	-1.341
Clubs 2+3	-1.211	-14.326

Table 3: Final real personal disposable income cluster analysis (1975Q1-2019Q2)

Log t	t statistic	Cluster
-0.297	-0.248	Finland, Ireland, Luxembourg, Norway, and the UK
-1.341	-1.140	Belgium, Denmark, France, Germany, Italy, Netherlands, Spain, Sweden, and Switzerland