

Europe's Income Convergence and the Latest Global Financial Crisis

René Cabral* and Francisco A. Castellanos-Sosa**

* Tecnológico de Monterrey
** University of Texas at Austin



Research Question

How has the recent financial crisis affected income convergence in the EU and the EMU?

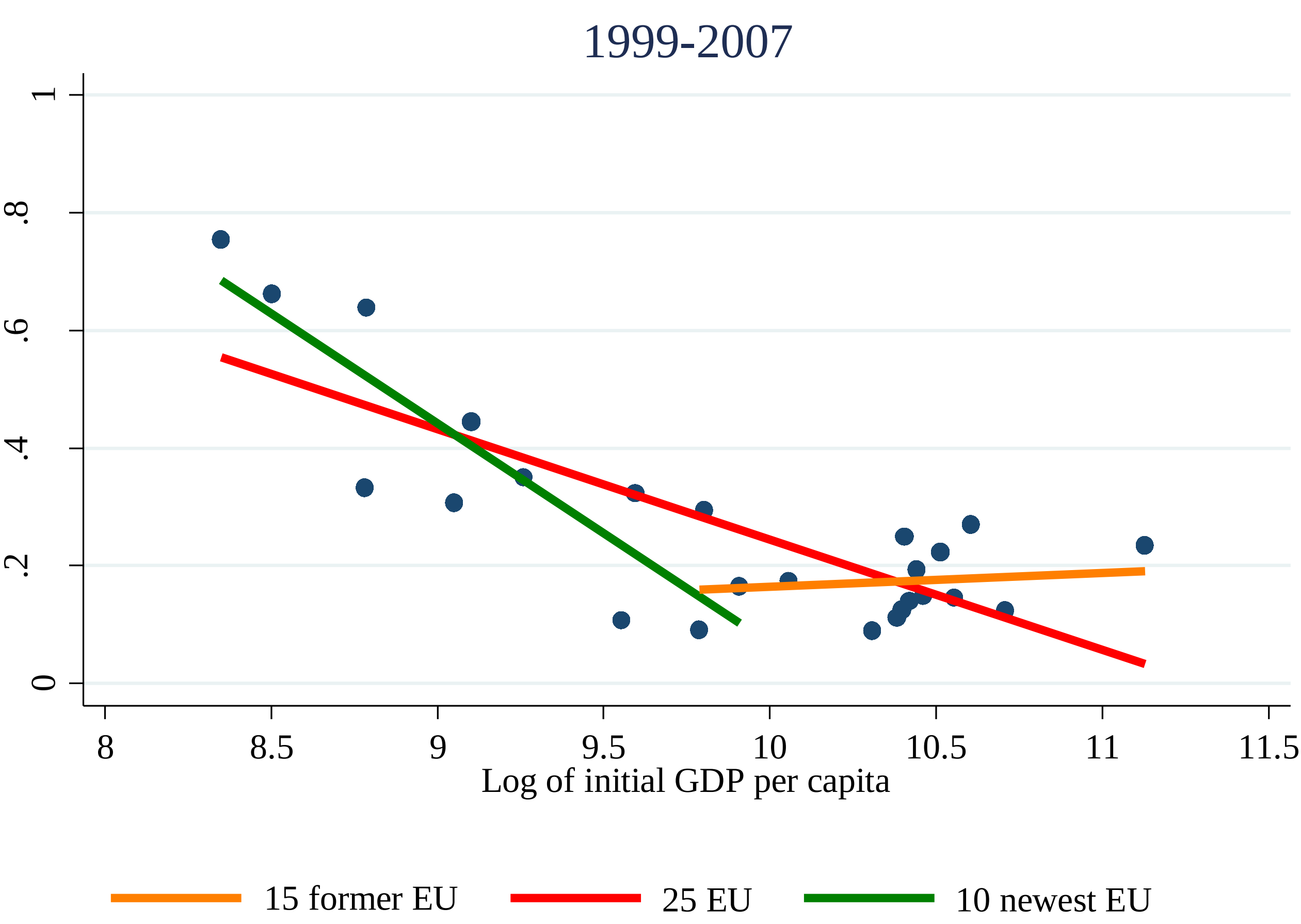
Contribution

- First on studying the effects of the recent FC on income convergence by **contrasting the effects of European countries' incorporation to both the EU and the EMU**.
- Revisiting the convergence debate in the EU and the EMU by **controlling econometric weaknesses** encountered in previous studies, such as heterogeneity and endogeneity.
- First on exploring the FC effects on income convergence **at country level** in Europe.

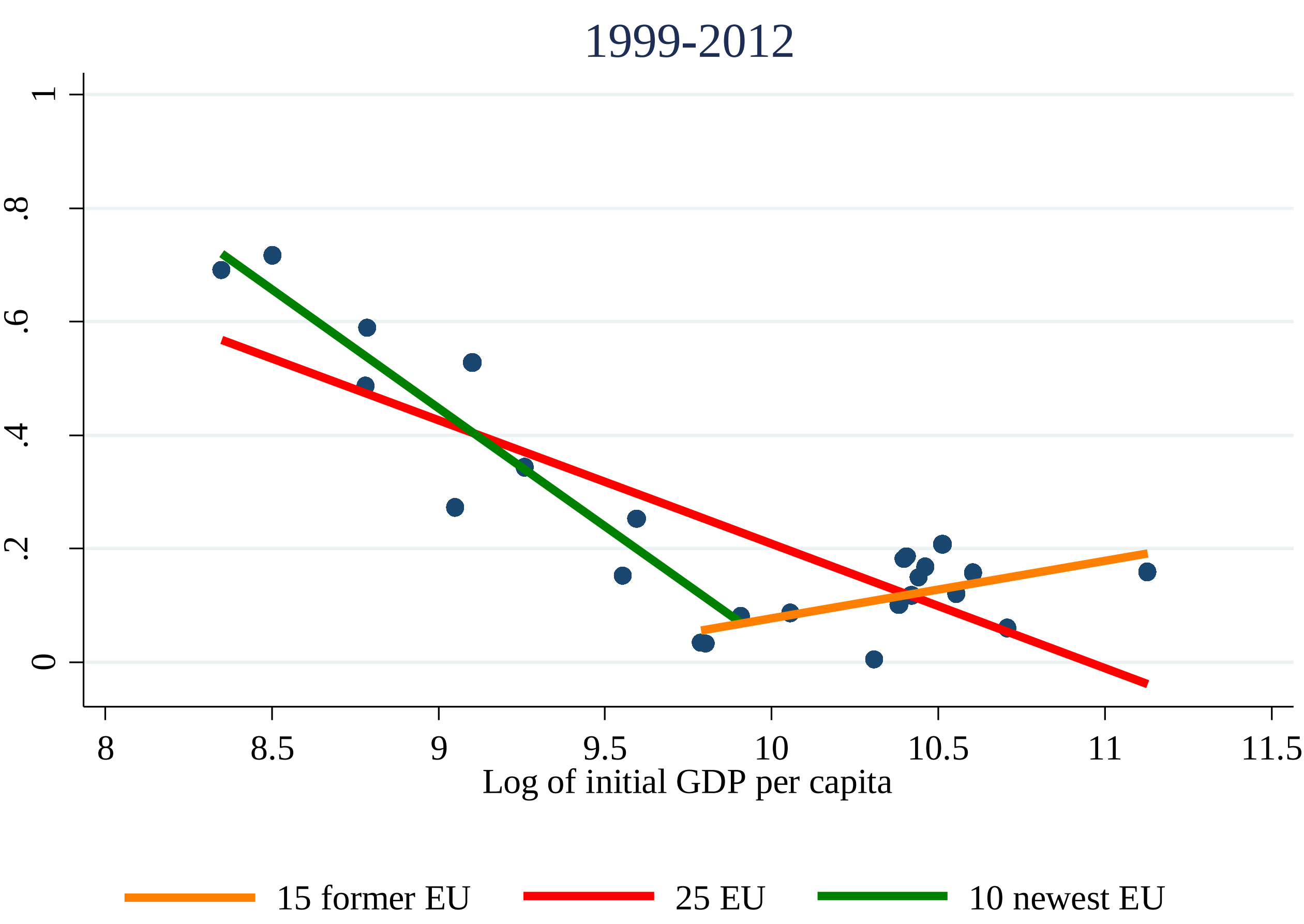
Main Results

- The latest global FC has:
 - ✓ brought greater absolute and conditional convergence rates to all the EU members,
 - ✓ affected richer members more heavily,
 - ✓ allowed less developed members to recover “more quickly”, and
 - ✓ decreased the per capita GDP by ~7-9%.
- The creation of the European Union has contributed toward economic growth (~6-9% higher per capita GDP) and taking the convergence rate to more than its double.
- No similar evidence is found concerning the European Monetary Union effect on economic growth. However, the convergence rate increases by about a half.

Graphical Analysis (Absolute Convergence)



$$\log y_{2007} - \log y_{1999} = 2.119^{***} - 0.187 \log y_{1999}^{***}$$



$$\log y_{2012} - \log y_{1999} = 2.393^{***} - 0.218 \log y_{1999}^{***}$$

Data and Methodology

Data for 25 EU member states in the 1973–2012 period is gathered from:

- The World Bank (2018) (Socioeconomic variables)
- Barro and Lee (2013) (Schooling)
- Freedom House (2018) (Political variables)

By following Mankiw et al. (1992), we depart from:

$$\Delta \log y_{i,t} = \alpha_{i,t} + \beta \log y_{t-1} + v_{i,t}$$

Then, continue with a **System GMM** following Blundell and Bond (1998) to measure **conditional convergence**.

$$y_{i,p} = \mu_i + \eta_p + \alpha y_{i,p-1} + \beta_0 + \beta_1 s_{i,p} + \beta_2 n_{i,p} + \beta_3 h_{i,p} + \beta_4 EU_{i,p} + \beta_5 EMU_{i,p} + \beta_6 FC_{i,p} + v_{i,p}$$

Controlling for **investment** ($s_{i,p}$), **population** ($n_{i,p}$), and **human capital** ($h_{i,p}$) (see Table 4). As well as for domestic variables, such as **government size**, **openness**, and **political stability** (see Table 5).

SYS-GMM Analysis (Conditional Convergence)

Table 4 Dynamic Estimates Controlling for EU, EMU, and Financial Crisis Shocks.						
Dependent Variable: Ln (GDP pc)	(a)	(b)	(c)	(d)	(e)	(f)
Lagged Ln (GDP pc)	0.903*** (0.028)	0.843*** (0.0439)	0.808*** (0.051)	0.849*** (0.039)	0.862*** (0.030)	0.861*** (0.041)
Ln (Investment ratio)	0.089 (0.098)	0.180* (0.105)	0.245* (0.130)	0.189* (0.118)	0.056 (0.125)	0.061 (0.154)
Ln (Population growth)	0.012 (0.015)	-0.003 (0.014)	-0.008 (0.016)	-0.002 (0.014)	0.009 (0.016)	0.009 (0.017)
Ln (Years of schooling)	0.015 (0.0127)	0.254** (0.127)	0.288** (0.142)	0.266* (0.148)	0.283*** (0.105)	0.286** (0.118)
EU entry dummy		0.064 (0.037)			0.002 (0.034)	
EMU entry dummy				-0.011 (0.031)	-0.095*** (0.025)	
FC dummy					0.026 (0.026)	
Constant	0.810 (0.551)	0.537 (0.600)	0.557 (0.682)	0.429 (0.762)	0.701 (0.569)	0.686 (0.696)
Implied impacts						
EU entry dummy			6.61%*		0.20%	
EMU entry dummy				-1.09%	-0.10%	
FC dummy					-9.06%***	-9.06%***
Implied $\lambda_{system} = -\frac{\ln(\beta)}{1-\beta}$	2.04%***	3.42%***	4.26%***	3.27%***	2.97%***	2.99%***
Observations	124	124	124	124	124	124
Countries	22	22	22	22	22	22
Instruments	29	29	29	29	29	29
Hansen test	0.69	0.62	0.75	0.64	0.83	0.89
AB(2) test	0.45	0.66	0.70	0.72	0.04	0.09
Wald χ^2	1,701.0	1,703.9	1,206.1	1,809.0	2,451.8	2,982.8

Notes: System GMM regressions with robust standard errors in parentheses.

The symbols *, **, and *** refer to levels of significance of 10%, 5%, and 1%, respectively.

Table 5 Dynamic Estimates Controlling for EU, EMU, Financial Crisis Shocks, and Domestic Variables.						
Dependent Variable: Ln (GDP pc)	(a)	(b)	(c)	(d)	(e)	(f)
Lagged Ln (GDP pc)	0.940*** (0.034)	0.890*** (0.045)	0.856*** (0.055)	0.904*** (0.046)	0.910*** (0.029)	0.897*** (0.047)
Ln (Investment ratio)	0.070 (0.067)	0.127 (0.088)	0.202* (0.111)	0.146 (0.107)	-0.007 (0.102)	0.057 (0.115)
Ln (Population growth)	-0.005 (0.012)	-0.019 (0.015)	-0.028** (0.016)	-0.019 (0.016)	-0.003 (0.011)	-0.010 (0.013)
Ln (Years of schooling)	0.015 (0.012)	0.358** (0.159)	0.387** (0.191)	0.410* (0.212)	0.268** (0.132)	0.321* (0.186)
EU entry dummy		0.088 (0.053)			0.045 (0.059)	
EMU entry dummy				-0.023 (0.034)	-0.067*** (0.025)	
FC dummy					-0.077*** (0.023)	
Constant	1.128 (1.319)	1.862 (1.764)	2.410 (2.064)	1.831 (1.861)	2.881 (1.539)	3.015* (1.618)
Domestic variables	Yes	Yes	Yes	Yes	Yes	Yes
Implied impacts						
EU entry dummy			9.20%*		4.60%	
EMU entry dummy				-2.27%	-1.09%	
FC dummy					-7.41%***	-6.48%***
Implied $\lambda_{system} = -\frac{\ln(\beta)}{1-\beta}$	1.24%***	2.33%***	3.11%***	2.02%***	1.89%***	2.17%***
Observations	121	121	121	121	121	121
Countries	21	21	21	21	21	21
Instruments	29	29	29	29	29	29
Hansen test	0.74	0.65	0.67	0.77	0.76	0.75
AB(2) test	0.53	0.40	0.50	0.48	0.85	0.85
Wald χ^2	2,913.7	3,091.6	2,845.7	3,950.7	7,544.7	7,573.9

Notes: System GMM regressions with robust standard errors in parentheses.

The symbols *, **, and *** refer to levels of significance of 10%, 5%, and 1%, respectively.