



Munich Personal RePEc Archive

The impact of European integration on institutional development

Schönfelder, Nina and Wagner, Helmut

FernUniversität in Hagen

3 March 2015

Online at <https://mpra.ub.uni-muenchen.de/63392/>
MPRA Paper No. 63392, posted 02 Apr 2015 01:17 UTC

The Impact of European Integration on Institutional Development

Nina Schönfelder

University of Hagen, Faculty of Economics, Chair of Macroeconomics, 58084 Hagen, Germany, Phone: +49 2331 987 - 2379, Email: nina.schoenfelder@fernuni-hagen.de (corresponding author)

Helmut Wagner

University of Hagen, Faculty of Economics, Chair of Macroeconomics, 58084 Hagen, Germany, Phone: +49 2331 987 - 2640, Email: helmut.wagner@fernuni-hagen.de

03 March 2015

Abstract:

This paper investigates the speed of institutional development induced by European integration. The hypotheses are the following. The prospect for European countries to join the EU disposes them to strengthen their institutions, so that the speed of institutional development is high. Furthermore, EU Member States preparing for the introduction of the euro have incentives to develop their institutions, but the speed of institutional development is much lower. As soon as Member States introduce the euro, institutional development grinds to a halt, or is even reversed, as there could be incentives to undo reforms. To test these hypotheses, we estimate a dynamic panel data model, in which the institutional development is measured as positive changes in Worldwide Governance Indicators (WGIs). The WGIs are explained by the “status” of the European countries (i.e. being a member of the euro area, a Member State of the EU preparing to adopt the euro, an acceding country, a candidate country, a potential candidate country or none of the above) and additional controls. To sum up the findings, we can confirm a positive effect of prospective EU membership. Being a Member State does not influence the institutional development path. However, for members of the euro area, there is robust evidence for institutional deterioration in one particular area, namely control of corruption.

Keywords: Institutional development, transition economies, European integration, euro area, panel data

JEL: F55, O43

Contents

1	Introduction	1
2	Theoretical framework.....	3
3	Econometric model and estimation method	8
4	Data	12
4.1	Worldwide Governance indicators	12
4.2	Status dummy variables	14
5	Results	16
6	Robustness checks	31
7	Conclusion.....	33

1 Introduction

It is widely recognized that the institutional development and transformation process in the transition countries of Central and Eastern Europe paved the way for the considerable and ongoing enlargement of the European Union (EU). Furthermore, the prospect for European countries to join the EU creates additional incentives for them to strengthen their institutions, and the EU serves as an “outside anchor” for the reform process (Berglöf, Roland 1997, p. 2). On the one hand, conditionality on the EU accession (Copenhagen criteria) is an obstacle candidate countries have to overcome. On the other hand, it provides the transition countries’ governments with guidelines for reforms. The adoption of the euro does not have direct legal effects on institutional development, but it can have economic implications on it. Liikanen (2005, p. 60) argues that the Maastricht criteria will foster future institutional reforms, not just those explicitly required in the Maastricht criteria.

One aim of this paper is to assess empirically whether the prospect for European countries to join the EU disposes them to strengthen their institutions. Certainly, one would expect a positive impact of this prospect. The more challenging question concerns what happens to the institutional development after the country has become a Member State of the EU preparing for the introduction of the euro and finally a member of the euro area.

Some empirical literature exists on the link between prospective EU membership and institutional development in the transition countries of Central and Eastern Europe. In a cross-section, Beck and Laeven (2006) identify a positive link between the EU accession and the Worldwide Governance Indicators, although they do not control for reverse causality. Di Tommaso et al. (2007) examine the determinants of institutional change using a panel data set comprising 25 transition economies. Their approach is to treat institutional change as a multidimensional unobserved variable. The results suggest that an external anchor, such as EU accession, can break the path dependence of institutional change to some extent. Using a Hausman–Taylor model for a panel data set of 25 transition countries, Schweickert et al. (2011) identify a positive link between the pre-accession incentives provided by the EU and NATO and institutional development. Building on a theoretical model that explains how the prospective EU membership drives regulation in applicant countries beyond their equilibrium level of regulatory quality, Mattli and Plümpert (2004) estimate that the EU application accounts for approx. 40% of the variance of regulatory quality in transition countries. Regulatory quality is measured by the average of the nine European Bank for Reconstruction and Development (EBRD) transition indicators. Moreover, Mattli and Plümpert (2004) provide evidence that exogenous changes in the perceived likelihood of EU accession have an

impact on the pace of reforms. Countries with the prospect of late accession reform significantly less than their early accession counterparts. Brücker et al. (2005) test whether accession candidate countries have a lower long-term labour to output ratio and adjust labour productivity faster to its long-run levels than other transition countries. This is an indication for the hardening of soft budget constraints (SBC), which the EU accession can foster according to their model. Indeed, they find that in accession candidate countries the speed of adjustment is significantly larger and labour productivity is significantly higher. The only paper that finds no significant effect of prospective EU membership on development of economic institutions is that of Staehr (2011). He estimates the impact of EU enlargement on political and economic reforms in former socialist countries from 1989 to 2008. A set of dummy variable captures the progress of each transition country in the EU enlargement process; political reforms comprise political rights and civil liberties, and the EBRD transition indicators capture economic reforms. While prospective and actual membership have positive effects on political reforms, the effect on economic reforms is insignificant or even negative. However, as political freedom explains much of the progress in economic reforms, and political reforms are in turn influenced by the actual and prospective EU membership, economic reforms are indirectly determined by the EU enlargement process, rather than directly.

Two strands of literature analyse the impact of the euro area membership. The first focuses on reforms in the regulation of product and labour markets. The second examines the influence on fiscal deficits. For example, Alesina et al. (2010) show that the euro accelerated reforms in the product markets and seems to have been accompanied by wage moderation in the labour market. Duval and Elmeskov (2005), Belke et al. (2007) and Belke and Vogel (2012) also contribute to this strand of literature. Investigating the modes of organization of the budget process in ten Central and Eastern European countries, Gleich (2003) detects a relationship between institutional settings and fiscal performance. He shows that procedures that contribute to reducing collective action problems have been associated with more fiscal discipline. Hence, progress in the institutional structure of the budgeting process can facilitate the compliance with the Maastricht criteria and the Stability and Growth Pact. Bayar and Smeets (2009) and Ballabriga and Martinez-Mongay (2007) also found a positive effect of the Maastricht Treaty on fiscal balance. In contrast, Galli and Padovano (2008) and Mink and Haan (2005) do not find support for this thesis. Eijffinger and Stadhouders (2003) examine the relationship between inflation, the institutional design of monetary institutions and the rule of law. They argue that legal arrangements are a necessary condition for central bank independence, but the actual application of law is much more important to achieve

price stability. Institutional quality indicators are used as a proxy for the rule of law, and they are shown to be significantly and negatively related to the inflation rate.

However, to our knowledge, there is empirical literature on neither the link between EU membership with preparation to introduce the euro and institutional development nor the relationship between current euro area membership and institutional development. The only evidence is provided by a case study by Fernández-Villaverde et al. (2013), which shows that economic reforms were abandoned and institutions deteriorated after the introduction of the euro in Spain, Ireland, Greece and Portugal. The aim of our paper is to shed light on these relationships.

In this paper, the term “institutions” is defined broadly and we do not explore specific policy measures or institutional arrangements. To measure institutional development, we employ the six Worldwide Governance Indicators (WGIs) of Kaufmann et al. (2010): Voice and Accountability (VaA), Control of Corruption (CoC), Government Effectiveness (GE), Political Stability and Absence of Violence (PSNV), Rule of Law (RoL) and Regulatory Quality (RQ). Institutional development is measured as positive changes in the Worldwide Governance Indicators (WGIs). This paper is organised as follows. In Section 2, we discuss the theoretical considerations why we care about institutional development, and how the European integration matters for institutional development. Section 3 describes our empirical model and the estimation method. The data on institutional development and the countries’ status is explained in Section 4. Section 5 presents and discusses our result and Section 6 provides various robustness checks. To sum up our findings, we can confirm a positive effect of prospective EU membership for most WGIs and econometric specifications. In particular, prospective EU membership reduces the persistence of institutional development. Being a Member State does not influence the institutional development path. However, there is robust evidence for the deterioration of control of corruption for members of the euro area. The last section contains the conclusion.

2 Theoretical framework

Three central questions shape our theoretical framework. First, does institutional development matter? Second, does the EU influence institutional development, and which role does the EU conditionality play in the accession process? Third, does the membership in the euro area matter for institutional development?

In the Maastricht Treaty, the European Union committed to “promote economic and social progress which is balanced and sustainable” (European Union 29/07/1992, Common Provisions, Article B). Among others, catching up in the institutional development of Member States could contribute to long-term income convergence in the EU and the euro area. Roland (2000, p. XIX) emphasizes the importance of adequate institutions for economic growth in transition countries: the experience of transition from socialism to capitalism in former socialist economies shows that the structural policies of liberalization, stabilization and privatization should be accompanied by adequate institutions to deliver successful outcomes. According to the development and growth literature, there is a positive link between the institutional development of a country and its development stage and income growth, respectively. Since the contributions by North (1981, 1990), many attempts have been made to verify this hypothesis empirically (see for example Beck and Laeven (2006) and references therein). Here, we discuss two empirical papers, which particularly shape our selection of control variables. Dollar and Kraay (2003) investigate the partial effects of institutions and trade on GDP growth in a panel of around 100 countries and decadal growth rates in the 1990s, 1980s and 1970s. Using a two-stage least-squares estimation (2SLS) in first differences and lagged explanatory variables as instruments, they find a substantial partial effect of changes in trade on changes in GDP growth. Moreover, changes in the measures of institutions have a positive but smaller effect. Rigobon and Rodrik (2005) estimate the interrelationships between rule of law, democracy, openness and income. In a cross section, they use differences in the variances of error terms across sub-samples of the data to identify the coefficients of the four endogenous variables. This strategy is called identification through heteroscedasticity (IH) and is an alternative to the instrumental variable approach. They find that democracy and law of rule influence income positively and that the rule of law has a stronger impact on income than democracy. However, the reverse is also likely to be true. They find some indication that higher income produces better institutions (i.e. rule of law and democracy). Regarding openness, their results are striking, as they find an asymmetric effect of openness on economic and political institutions. Openness improves the indicator rule of law, but worsens democracy, although the former effect is not significant in every specification. Even if institutional development is socially desirable in a country, reforms may be not implemented because of problems covered by the public choice theory. These could be, for example, strategic decisions of self-interested politicians and national or international distributional conflicts (see for example Drazen 2000).

The second question is related to the literature on the EU as an external or outside anchor and EU conditionality. Crombrughe et al. (1996) outline the motivation for fast integration of transition countries into the EU based on self-fulfilling expectations. The transition country's

expectation of EU entry can coordinate the expectations towards a fast-growth, catching-up equilibrium. The premise is that both the transition countries and the EU transparently and strongly commit to reforms and enlargement, respectively. This would accelerate investments and growth in the transition countries and attract foreign direct investment. This can be shown in a model of self-fulfilling rational expectations based on Krugman (1991), which Crombrugge et al. (1996, pp. 2, 16-17) apply to EU enlargement. Reforms that strengthen the flexibility of an economy or an exogenous boom, for example, in foreign direct investment can boost the economy. However, to achieve enduring high economic growth rates, the co-ordination of the positive expectations of investors is important if there are external economies (i.e. positive externalities). If the reforms are expected to be credible, growth-promoting actions of investors (i.e. investment, sectoral reallocation, political support for reforms) are more likely. The credibility of a reform is taken for granted when investors expect the reform to be permanent and if each investor believes that other investors will also expect it to be permanent. Hence, whether the promised growth effects of reforms occur also depends on the public's expectations about the future (Crombrugge et al. 1996, p. 2). A strong commitment to enlargement and transparent conditionality can coordinate these expectations towards a catching-up equilibrium.

Roland and Verdier (2003) develop a model to analyse law enforcement problems in transition economies with coordination problems and multiple equilibria. They show that accession to the EU provides a mechanism to overcome a "bad" equilibrium if the "accessing" country is small enough relative to the EU. Mattli and Plümper (2004) provide a formal model that explains how prospective EU membership drives regulation in applicant countries beyond their equilibrium level of regulatory quality. The paper by Brücker et al. (2005) models the soft budget constraint (SBC) problem in transition economies as a war of attrition between the applicant countries' governments and firms. They show that outside conditionality can foster SBC hardening.

The role of EU conditionality in the accession process can be discussed separately from a normative and a positive point of view, i.e. how the EU conditionality should be shaped and how it was in fact applied. The principle of conditionality requires that clear and equal accession conditions apply to all countries, their progress is evaluated coherently and without discrimination by the EU and their status of accession is directly dependent upon these evaluations (Kochenov 2008, p. 299). European Union conditionality, if designed and conducted properly, has several positive effects (Crombrugge et al. 1996, p. 9). First, it provides the transition countries' governments with guidelines for reforms. Second, it introduces competition between political parties in a transition country for the best reforms to

meet the conditions if the public regards the EU membership as desirable. Third, it enables the transition countries to make a sovereign decision on whether it is worth entering the EU based on a cost–benefit analysis.

Weber (1995) examines the political conditionality on trade and aid by the European Union, which he calls “European Union conditionality”, from the late 1980s to 1994. Following the collapse of the Eastern bloc, the Central and Eastern European (CEE) states expressed the desire to reintegrate themselves into Western Europe. The European Community (EC) launched several aid and trade programmes with explicit or implicit political conditionality regarding the rule of law, democracy and economic liberalization (Weber 1995, pp. 198–203). The first programme was the Poland, Hungary Aid for Reconstruction (PHARE), followed by association agreements, also called Europe agreements, with the CEE countries that joined the EU in 2004/2007 and later the stabilization and association agreements with the Western Balkan countries. Weber shows that the conditionality was not a paper tiger in the early 1990s. In several countries, the programmes were suspended or delayed in response to non-compliance (Weber 1995, pp. 198–203).

For the conditionality principle to work, the EU moved away from a deeply politicized practice of enlargement regulation to an increasingly legal enlargement regulation in the 1990s (Kochenov 2008, p. 297). The Copenhagen European Council formulated accession criteria in 1993:

Membership requires that the candidate country has achieved stability of institutions guaranteeing democracy, the rule of law, human rights and respect for and protection of minorities, the existence of a functioning market economy as well as the capacity to cope with competitive pressure and market forces within the Union. Membership presupposes the candidate’s ability to take on the obligations of membership including adherence to the aims of political, economic and monetary union. (European Council 22/06/1993, 7.A.iii)

These criteria are called the “Copenhagen criteria” and they were implemented by the Copenhagen-related documents in the course of the recent enlargements. In a jurisprudential analysis of the EU conditionality on the new CEE Member States, Kochenov (2008) shows that the EU successfully formed a framework of instruments for the application of the conditionality principle regarding the criteria “democracy” and “rule of law”. However, he concludes that the application of the instruments was a “resounding failure, if it was applied at all” (Kochenov 2008, p. 300), at least in the areas of democracy and rule of law. A country’s status towards accession was not linked to the Commission’s evaluation, so that the conditionality principle was de facto removed in the areas of democracy and rule of law (Kochenov 2008, pp. 300–301).

The third question concerns the influence of euro area membership on institutional development. Alesina et al. (2010) lay down some economic arguments why the membership in the euro area could accelerate and facilitate deregulation in product markets and liberalization and deregulation in labour markets. They describe two channels by which the euro could foster reforms: the competition channel and the adjustment channel. The former establishes a relationship between more competition due to the single market and the cost of regulation. If one agrees upon that a common currency is a necessary condition for having a truly common market, then the protection of insider firms and workers by anti-competitive regulation would become more costly and visible to consumers and voters. The second channel becomes relevant, whenever a country is losing competitiveness. The common currency eliminates the possibility of strategic devaluations, when the real wage growth is out of line with productivity growth. Hence, adjustment has to come by real wage adjustment and labour mobility and flexibility (Alesina et al. 2010, p. 2). This argument is related to the TINA (There Is No Alternative) argument. By introducing the euro, the member countries become unable to use monetary policy to accommodate asymmetric shocks. Instead, adjustment has to come via a boom or recession. This will be less painful in terms of unemployment, the more flexible the labour market is. Therefore, euro area members have to develop market-based adjustment channels to adjust to shocks (Bean 1998, p. 368; Alesina et al. 2010, p. 6). On the other side, some economists argue that the euro could hamper the labour market reforms. Reforms on the supply side entail negative short-term effects on employment. These can be alleviated by expansionary aggregate demand policies. In the euro area, member countries are constrained by the Stability and Growth Pact in pursuing fiscal policy, and they are unable to conduct monetary policy. Hence, the short-term costs of labour market reforms are higher in a common currency area and reforms may become politically unfeasible (Bean 1998, p. 377; Alesina et al. 2010, p. 7). Saint-Paul and Bentolila (2001) argue that this applies for big changes in labour market institutions, rather than small reforms. They show that large-scale labour market reforms will be harder to implement, whereas some gradual reforms towards flexibility are easier to implement within the euro area.

Berglöf et al. (2008; 2012) present a model where a member of a club, say of the EU, has incentives to reform beyond his privately optimal level. This model can also show under which conditions a club-in-club, for example the euro area, emerges and why even weak members of the outer club (EU) reform to meet the accession criteria of the inner club (euro area). The more heterogeneous the members of the organization are the more likely is the formation of an inner club. The imminent negative externality on the members of the outer organization is the driver for more effort. In this spirit, the creation of a common currency

area with strict criteria for joining (Maastricht criteria) is a “club-in-club” that remains open to every country willing to reform, and therefore joining the euro area (Bergl f et al. 2012, pp. 501–502).

In a case study, Fern ndez-Villaverde et al. (2013) show that economic reforms were abandoned and institutions deteriorated after the introduction of the euro in Spain, Ireland, Greece and Portugal. They argue that as the euro facilitated large inflows of capital, which enabled the emergence of the financial bubble in peripheral countries, economic reforms were abandoned, institutions deteriorated and the response to the credit bubble was delayed. This hampered the growth prospects of these countries. Fern ndez-Villaverde et al. (2013) analyse two channels to explain this development, which contrasted strongly with the German case. First, capital flows relaxed the economic constraints under which agents (e.g. a government, bank manager) were acting, which reduced the pressure for reforms. Second, capital inflows hindered the principal (e.g. voters, shareholders, investors) in extracting signals about the performance of the agent. Germany did not experience a loosening of its financing conditions because of the introduction of the euro, and it was faced with a stagnant economy. Hence, Germany implemented far-reaching structural reforms, so that the divergence in institutions between Germany and the other peripheral countries increased after the introduction of the euro (Fern ndez-Villaverde et al. 2013, pp. 146–147).

To sum up the literature, there could be indirect effects of the Maastricht criteria on institutional reforms. As soon as Member States introduce the euro, there are virtually no effective enforcement measures, so the incentives to undertake institutional reforms may disappear. However, the conclusions of the theoretical models on this question are ambiguous.

3 Econometric model and estimation method

In our empirical analysis, we are interested in revealing the speed of institutional development induced by European integration. The hypotheses are the following. The prospect for European countries to join the EU disposes them to strengthen their institutions, so that the speed of institutional development is high. Furthermore, EU Member States preparing for the introduction of the euro have incentives to develop their institutions, but the speed of institutional development is much lower. As soon as Member States introduce the euro, institutional development grinds to a halt, or is even reversed, as there could be incentives to undo reforms. Of course, it is difficult to measure incentives directly. In fact, we

can only capture actual outcomes, i.e. the values of the indicators for institutional development.

It must be pointed out that the status of a country may affect its institutional development with a time lag rather than instantaneously since it usually takes some time to implement institutional reforms. Beyond that, one can suppose a level effect of the institutional development. Leaving the other variables constant, a country that is highly institutionally developed will probably face more difficulties in developing its institutions further at the same pace as a less institutionally developed country. Moreover, the marginal effect of the status on the change in the WGI may depend on the level of the WGI. Therefore, we introduce interaction terms between the status variables and the lagged-level WGIs.¹ This also allows for different slopes for the level effect of the WGIs depending on the status.² From the institutional development and growth theory one can assume the following relationships between institutional development and time varying control variables. Institutional development depends positively on the GDP per capita and the level of openness of a country.³ Also the control variables probably affect the institutional development with a time lag since it usually takes some time to implement institutional reforms. Hence, we introduce the first lags of the control variables to the estimation equation. Finally, one can also test for country and time effects.

The issue of potential endogeneity of regressors is highly relevant to our analysis. If one regressor is correlated with the error term, the least-squares estimates of the coefficients are inconsistent. This is called the simultaneous equation bias (see for example Greene 2000, pp. 652–662; Cameron, Trivedi 2007, pp. 90–95 and Baltagi 2008, pp. 121–129). We hypothesize an influence of a European country's status on the change in WGIs. However, the reverse is also likely to be true. As potential candidate, candidate and acceding countries improve their institutions, they are rewarded with a higher status. This corresponds to the conditionality principle discussed in Section 2 that a country's status towards accession shall be linked to its institutional development. It is reasonable to assume a delay of the "reward" for at least one period, as the evaluation by the Commission and the political decision

¹ The hypothesis to be tested is conditional in nature. Being, for example, a potential candidate country is associated with an institutional improvement if the institutional development level is low, but not if the institutional development level is high. To be precisely, the improvement in the WGIs is the greater the lower the previous year WGI.

² Indeed, both statements (effect of the status depends on the previous period WGIs; level effect of previous period WGIs depends on the status) are logically symmetric. An interaction model cannot distinguish which variable (status or WGI) is the conditioning one (Kam, Franzese 2005, p. 13; Brambor et al. 2006, p. 72). Both statements are interesting on their own and we proceed to analyse both statements.

process take some time. Hence, the status variable in equation (1) is probably weakly exogenous or predetermined.

As for the status variable, reverse causality may also apply to the control variables GDP per capita and openness. The growth and development literature, which tries to identify the effect of good institutions on economic development, struggles with the interrelationship between these variables (see the discussion in Section 2). Hence, one has to ensure that the control variables do not correlate with the error term.

According to our considerations, we form the following estimation equation:

$$(1) \quad \begin{aligned} WGI_{i,t} = & \beta_0 + \beta_1 WGI_{i,t-1} + \mathbf{Status}'_{i,t-1} \beta_2 + WGI_{i,t-1} \mathbf{Status}'_{i,t-1} \beta_3 \\ & + \beta_4 GDP_{i,t-1} + \beta_5 Trade_{i,t-1} + \alpha_i + \gamma_t + \varepsilon_{i,t} \end{aligned}$$

$WGI_{i,t-1}$ is the lagged dependent variable, and its coefficient β_1 indicates the persistence of the WGI. The variable $\mathbf{Status}_{i,t-1}$ is not continuous but a column vector of the status dummy variables $\mathbf{Status}_{i,t-1} = [MBEA_{i,t-1}, \dots, PCEU_{i,t-1}]'$. We omit the status dummy variable NO , which indicates the base group, to avoid the dummy variable trap. β_2 and β_3 are the corresponding vectors of coefficients, α_i are the fixed effects, γ_t are the time effects, and $\varepsilon_{i,t}$ is the disturbance term. $GDP_{i,t-1}$ and $Trade_{i,t-1}$ are the control variables GDP per capita in US dollars and trade as a percentage of the GDP. Trade is defined as imports plus exports. All the control variables are in logarithms.⁴

The model can be considered to be for the level of or increase in the WGI. Rearranging equation (1) yields

$$(2) \quad \begin{aligned} \Delta WGI_{i,t} = & \beta_0 + (\beta_1 - 1) WGI_{i,t-1} + \mathbf{Status}'_{i,t-1} \beta_2 + WGI_{i,t-1} \mathbf{Status}'_{i,t-1} \beta_3 \\ & + \beta_4 GDP_{i,t-1} + \beta_5 Trade_{i,t-1} + \alpha_i + \gamma_t + \varepsilon_{i,t} \end{aligned}$$

This rearrangement clarifies that we are interested in explaining the speed of institutional development, i.e. the expected year-to-year changes in the WGI. All the coefficients are identical but the coefficient of the lagged dependent variable becomes less intuitive to interpret. Therefore, we estimate equation (1) throughout the entire analysis.

³ We also tested FDI as control variable. The motivation is that FDI inflow can induce a transfer of best practices and competition in a country. FDI turned out to be insignificant in every specification, so we dropped this control variable.

⁴ It is not necessary to include time-invariant control variables to equation (1). Once we have to remove the fixed effects, all time-invariant determinants, which could affect institutional development and are correlated with the other regressors, are excluded from the estimation equation.

To illustrate the interpretation of the coefficients of the dummy variables and their interaction terms with the WGI, we present the conditional expectations of equation (1). For the base group NO, the conditional expectation is

$$(3) \quad \begin{aligned} E(WGI_{i,t} | [PCEU_{i,t-1}, \dots, MBEA_{i,t-1}]' = 0, WGI_{i,t-1}, GDP_{i,t-1}, Trade_{i,t-1}, \alpha_i, \gamma_t) \\ = \beta_0 + \beta_1 WGI_{i,t-1} + \beta_4 GDP_{i,t-1} + \beta_5 Trade_{i,t-1} + \alpha_i + \gamma_t \end{aligned}$$

The WGIs are supposed to be state-dependent. Hence, the coefficient β_1 is between 0 and 1. For potential candidate countries ($PCEU = 1$), the conditional expectation of equation (1) is

$$(4) \quad \begin{aligned} E(WGI_{i,t} | PCEU_{i,t-1} = 1, [CCEU_{i,t-1}, \dots, MBEA_{i,t-1}]' = 0, WGI_{i,t-1}, GDP_{i,t-1}, Trade_{i,t-1}, \alpha_i, \gamma_t) \\ = (\beta_0 + \beta_2^{PCEU}) + (\beta_1 + \beta_3^{PCEU}) WGI_{i,t-1} + \beta_4 GDP_{i,t-1} + \beta_5 Trade_{i,t-1} + \alpha_i + \gamma_t \end{aligned}$$

As we suppose a positive intercept shift and a reduction in persistence of the WGIs (slope shift), β_2^{PCEU} should be positive and β_3^{PCEU} negative, respectively. Hence, the differential intercept β_2^{PCEU} shifts up the line, whereas β_3^{PCEU} lowers the slope of the line. The derivations of the conditional expectations for the other status dummy variables are analogous.

In interaction models, the interpretation of the coefficients deserves some attention and carefulness. The coefficient of a constitutive term, that is one of the elements that constitutes an interaction term, for example β_1 or β_2 , must not be interpreted as the marginal or average effect of a change in the independent variable on the dependent variable.⁵ The coefficient β_2 only captures the effect of $Status_{t-1}$ on WGI_t when WGI_{t-1} is zero. For example, a country with world average quality in institutions (governance indicator is zero) experiences an increase in its institutional quality by β_2 if it was a potential candidate country for the EU last year. Moreover, the standard errors of interest are not those of β_2 or β_3 , but of $\frac{\partial WGI_t}{\partial Status_{t-1}} = \beta_2 + \beta_3 WGI_{t-1}$. Hence, the standard error of interest can be calculated as⁶:

$$(5) \quad \hat{\sigma}_{\frac{\partial WGI_t}{\partial Status_{t-1}}} = \sqrt{\text{var}(\hat{\beta}_2) + WGI_{t-1}^2 \text{var}(\hat{\beta}_3) + 2WGI_{t-1} \text{cov}(\hat{\beta}_2, \hat{\beta}_3)}.$$

We calculated the standard errors and confidence intervals for all the status variables depending on the previous year governance indicator when presenting the estimation results in Section 5. Being a potential candidate country ($PCEU = 1$) has an effect on a WGI if the

⁵ Brambor et al. (2006) provide a valuable discussion of what to do and not to do with interaction models.

⁶ In interaction models of the type $Y = \beta_0 + \beta_1 X + \beta_2 Z + \beta_3 XZ + \varepsilon$, where Z is the conditioning variable, the standard error of the marginal effect of X on Y is (Brambor et al. 2006, p. 70)

$$\hat{\sigma}_{\partial Y / \partial X} = \sqrt{\text{var}(\hat{\beta}_1) + Z^2 \text{var}(\hat{\beta}_3) + 2Z \text{cov}(\hat{\beta}_1, \hat{\beta}_3)}.$$

coefficient on PCEU or its interaction term is not zero. To test for significance, one simply has to perform a F-test on the null-hypothesis that $\beta_2^{PCEU} = \beta_3^{PCEU} = 0$.

The equation (1) is estimated for each one of the six Worldwide Governance Indicators with two-way fixed effects OLS.⁷ The fixed-effects estimator is generally biased in dynamic models. This is known as the Nickell bias (Nickell 1981). However, as T gets large, the fixed effects estimator becomes consistent (Baltagi 2008, p. 147). The sample period is sufficiently large that the bias should not be large in this estimation. The alternative estimators that are usually used in the dynamic panel data context are the Anderson–Hsiao estimator and the generalized method of moments (GMM) procedures, such as the Arellano–Bond estimator, Arellano–Bover estimator and Blundell–Bond estimator, yet they are particularly suited to short panels with T fixed and $N \rightarrow \infty$ (Cameron, Trivedi 2007, p. 744). Short panels comprise few periods but many individuals (usually several hundreds of people or firms), whereas long panels comprise many time periods with relatively few individuals (for example countries) so that inference can be based on the assumption that $T \rightarrow \infty$ (Cameron, Trivedi 2007, pp. 721–723). Our sample can be characterized as intermediate, between a short and a long panel, as it comprises 33 European countries, which are in some way affiliated with the EU, and 23 control countries over up to 17 years.⁸

4 Data

4.1 Worldwide Governance indicators

To measure institutional development, we employ the Worldwide Governance Indicators (WGIs) of the World Bank produced by Kaufmann et al. (2013).^{9, 10} The WGIs consist of six composite indicators capturing governance perception. The six dimensions of governance are Voice and Accountability (VaA), Control of Corruption (CoC), Government Effectiveness (GE), Political Stability and Absence of Violence (PSNV), Rule of Law (RoL) and Regulatory Quality (RQ). The WGIs are composed of several hundred variables obtained from surveys of firms and households and subjective assessments collected by commercial business providers, non-governmental organizations, multilateral organizations and other public sector

⁷ Our results were obtained using R 2.15.2 with the packages `plm` 1.3-1, `lmtest` 0.9-32 and `car` 2.0-19 (R Core Team 2012; Croissant, Millo 2008; Zeileis, Hothorn 2002; Fox, Weisberg 2011).

⁸ See also Deutsche Bundesbank (2012, pp. 23–25) for an empirical application to a similar sample as well as Alesina et al. (2010), both of which apply a fixed-effects estimator.

⁹ For a detailed description of the WGI methodology, see Kaufmann et al. (2010).

bodies. The variables are clustered along the six dimensions of governance by an unobserved components model. By following this method, it is possible to construct margins of error, which indicate the underlying uncertainty, and assign weights according to the informative signal of the source (Kaufmann et al. 2010, pp. 5–11). The WGI is normally distributed, with zero mean and ranging approximately from –2.5 to 2.5. Table 1 describes the six dimensions of the WGI.

Table 1 Description of the six dimensions of the WGI

Voice and Accountability (VaA)	Capturing perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association and free media.
Political Stability and Absence of Violence/Terrorism (PSNV)	Capturing perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism.
Government Effectiveness (GE)	Capturing perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.
Regulatory Quality (RQ)	Capturing perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.
Rule of Law (RoL)	Capturing perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police and the courts, as well as the likelihood of crime and violence.
Control of Corruption (CoC)	Capturing perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.

Source: Kaufmann et al. (2010, p. 4)

The indicators cover the years 1996–2012 and are available on a two-year basis until 2002 and on a yearly basis subsequently. Hence, we have to handle the missing data problem for the WGI in 1997, 1999 and 2001. Since the lack of these WGI depends neither on their value nor on the values of other variables in the dataset, they are missing completely at random (for a discussion of missing data assumptions and their consequences, see Cameron, Trivedi 2007, pp. 923–941).

There are two simple ways to handle missing data in this case: listwise deletion¹¹ and mean imputation. The former has several disadvantages. Since 3 out of 17 observations (time dimension) are missing, deletion leads to a substantial reduction in the total number of observations. Even more information is lost if we calculate the year-to-year changes in the

¹⁰ The field of economic governance analyses the "performance of different institutions under different conditions, the evolution of these institutions, and the transitions from one set of institutions to another" (Dixit 2008). Important measures of institutional quality are the Worldwide Governance Indicators (WGI).

¹¹ Listwise deletion means reducing the sample to complete observations (Cameron, Trivedi 2007, p. 925).

WGIs, which indicate institutional development. Then the sample is essentially cut to 2003–2012. One possibility to mitigate this problem is to calculate two-year changes in the variables and skip the information for the years 2003, 2005, 2007, 2009 and 2011. This is carried out in Section 6 as a robustness check. The second way to handle missing data is mean imputation. Thereby, missing WGIs are replaced by the average value of the previous- and following-period WGIs for each country. The disadvantage is that this could have an impact on the distribution of the WGIs and therefore could affect the covariances with other variables. Nevertheless, we favour the latter way to handle the missing WGI problem to retain as much information as possible.

There are several potential problems with the WGIs to discuss as we use the cross-section and time dimension in our analysis.¹² As the WGIs are constructed to have a zero mean in each period, comparisons of WGIs over time could be a problem. Kaufmann et al. (2007, pp. 3–4) argue that this could indeed be problematic for absolute changes in the WGIs. However, relative comparisons of individual countries or country groups are not affected and valid, even if the world averages have changed over time. Indeed, the world averages of the underlying sources show little evidence of significant trends, as Kaufmann et al. show in previous works. Hence, this allows the interpretation of relative changes as absolute changes in individual or groups of countries (Kaufmann et al. 2007, pp. 3–4). A further point of criticism is that the WGIs might be too imprecise to yield sensible comparisons over time or countries. This criticism could be applied to every governance indicator because of measurement errors. However, the WGIs aggregate the existing indicators and hence their information about governance. Above that, margins of errors are computed, which allows the testing for significance in differences (Kaufmann et al. 2007, pp. 10–11).

4.2 Status dummy variables

To indicate the status or official relationship of the countries of our sample with the EU and the euro area, we construct a set of dummy variables. The sample covers 56 countries, among which are 33 European countries, which have been at least a potential candidate at some point in time (1996–2012) according to the classification in Table 2. The remaining 23 countries are other OECD countries and other European and Central Asian developing countries as defined by the World Bank. A full list is presented in the appendix.

¹² This and other critiques are discussed in Kaufmann et al. (2007).

Table 2 Classification of the status dummy variables

Status	Abbreviation for	Classification	Source
MBEA	Member State in the euro area	EU Member State at Stage Three of the Economic and Monetary Union, i.e. Member State in the euro area	(European Central Bank 2011, pp. 10–11)
CCEA	Candidate country for the euro area	EU Member State with derogation, i.e. a Member State preparing to adopt the euro but has not yet done so (other than Sweden)	(European Central Bank 2012, p. 64; European Union 2012)
ACEU	Acceding country for the EU	Country that has signed the treaty of accession	(European Commission 2012)
CCEU	Candidate country for the EU	Applicant country for EU membership that has been granted candidate country status by the European Council	(European Commission 2012, 2003, pp. 34–35; European Council 2012)
PCEU	Potential candidate for the EU	Countries of Central and Eastern Europe, which have signed Europe agreements; countries of the Western Balkans involved in the stabilization and association process, which are not yet candidate countries; 6 Western Balkans countries were identified as potential candidates during the Thessaloniki European Council summit in 2003; the European Council confirmed a clear European perspective for Kosovo in 2008; in 2009 Iceland applied to join the EU	(European Commission 2012, 2003, pp. 4–7; European Council 2012)
NO	No status	Other	

Notes: Many countries were granted candidate status at European Council meetings in December. As one should expect no effect for the respective year, our dummy variables generally display all the changes in the status occurring during the months November and December in the following year. Beyond that, we assign all the Member States that adopted the euro in 1999 the status CCEA until 1998. EU Member States that have been granted exemption from participating in the third stage of the Economic and Monetary Union (i.e. the United Kingdom and Denmark) and Sweden, which is de facto not willing to introduce the euro (see European Central Bank 2012, p. 64; European Union 2012), are not considered here.

The notation and classification of a country's status are based on the official specifications of the European Union and the European Central Bank. However, they are not identical in the case of Sweden and the potential candidates. Originally, the EU named countries involved in the stabilization and association process in the Western Balkans potential candidates, which are not yet official candidate countries (European Commission 2012). We extend this term to all the countries involved in a pre-accession strategy of the EU according to the definition in Table 2. Sweden, which is officially a EU Member States with derogation, is not considered here, as Sweden is de facto not willing to introduce the euro. For example, it did not participate in the European Exchange Rate Mechanism (ERM and ERM II) in the relevant period.

5 Results

We first present some descriptive statistics and perform a graphical analysis. The WGI summary statistics of our sample are reported in Table 3.

Table 3 Summary statistics of the WGIs

	VaA	CoC	GE	PSNV	RoL	RQ
Min.	-2.2097	-1.4952	-1.6757	-2.2431	-1.6924	-2.1762
1st Qu.	-0.1855	-0.5226	-0.3719	-0.2970	-0.4889	-0.1083
Median	0.8870	0.3591	0.7271	0.5025	0.7514	0.8978
Mean	0.4951	0.4881	0.5964	0.3205	0.4783	0.6094
3rd Qu.	1.3137	1.4405	1.5760	1.0095	1.4304	1.3480
Max.	1.8073	2.5856	2.2644	1.6681	1.9875	2.0766
NA's	4	14	19	22	14	20

The mean of the WGIs of our sample is above zero (0.32–0.60) and the median ranges from 0.35–0.90. This indicates that most of the countries of our sample have had better institutions than the world average. Interestingly, the median for each indicator is higher than its mean except for CoC. Hence, there are some countries with very high control of corruption, but many countries have an undersized control of corruption. To show the institutional development of European countries that have been at least potential candidates at some point in time, we present scatterplots in Figure 1. One can see an improvement of the WGIs from 1996 to 2012 in the least performing countries, especially for VaA, RoL and RQ. In contrast, the best performing countries have not improved further.

Figure 1 Scatterplots of the WGI over time

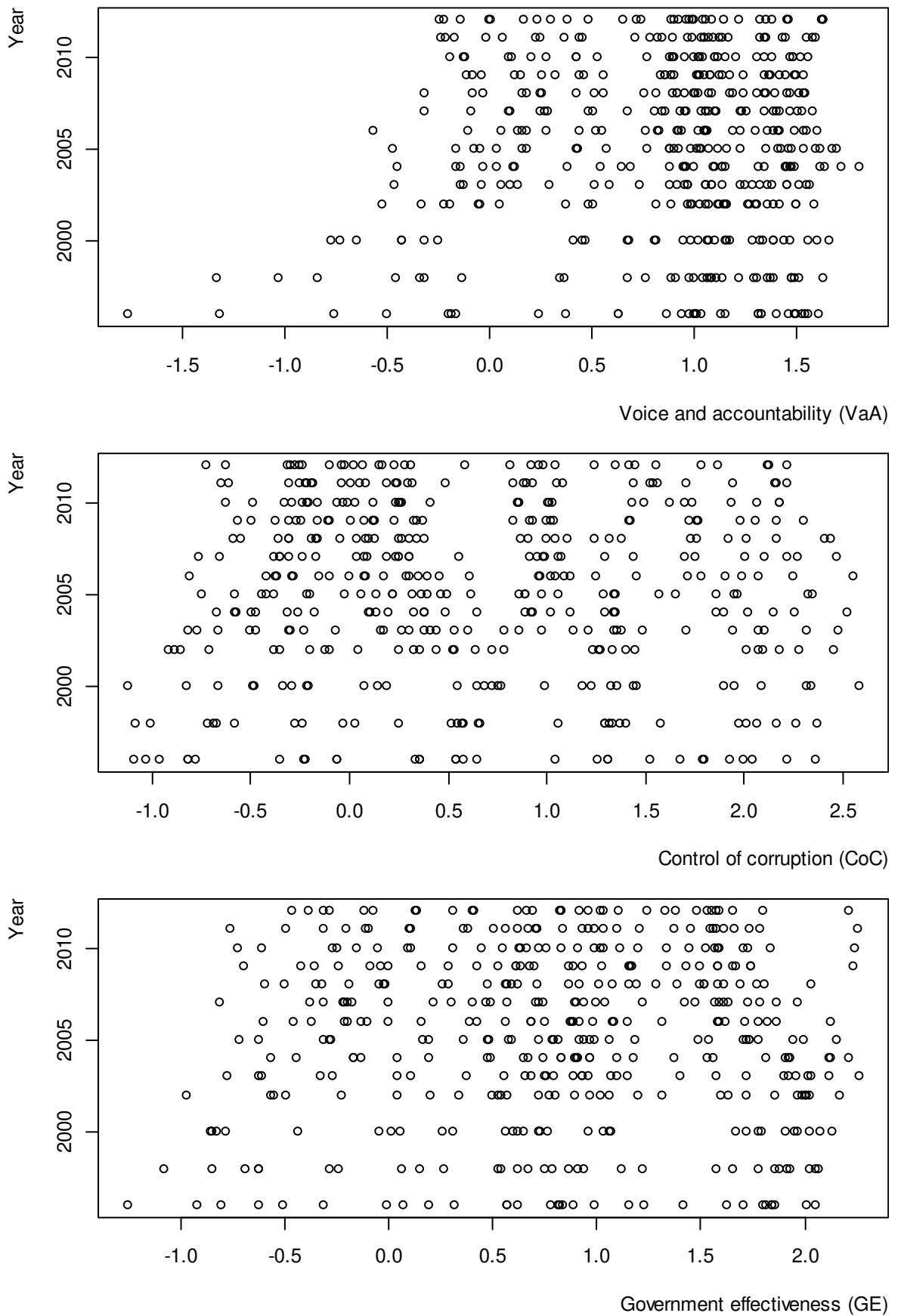
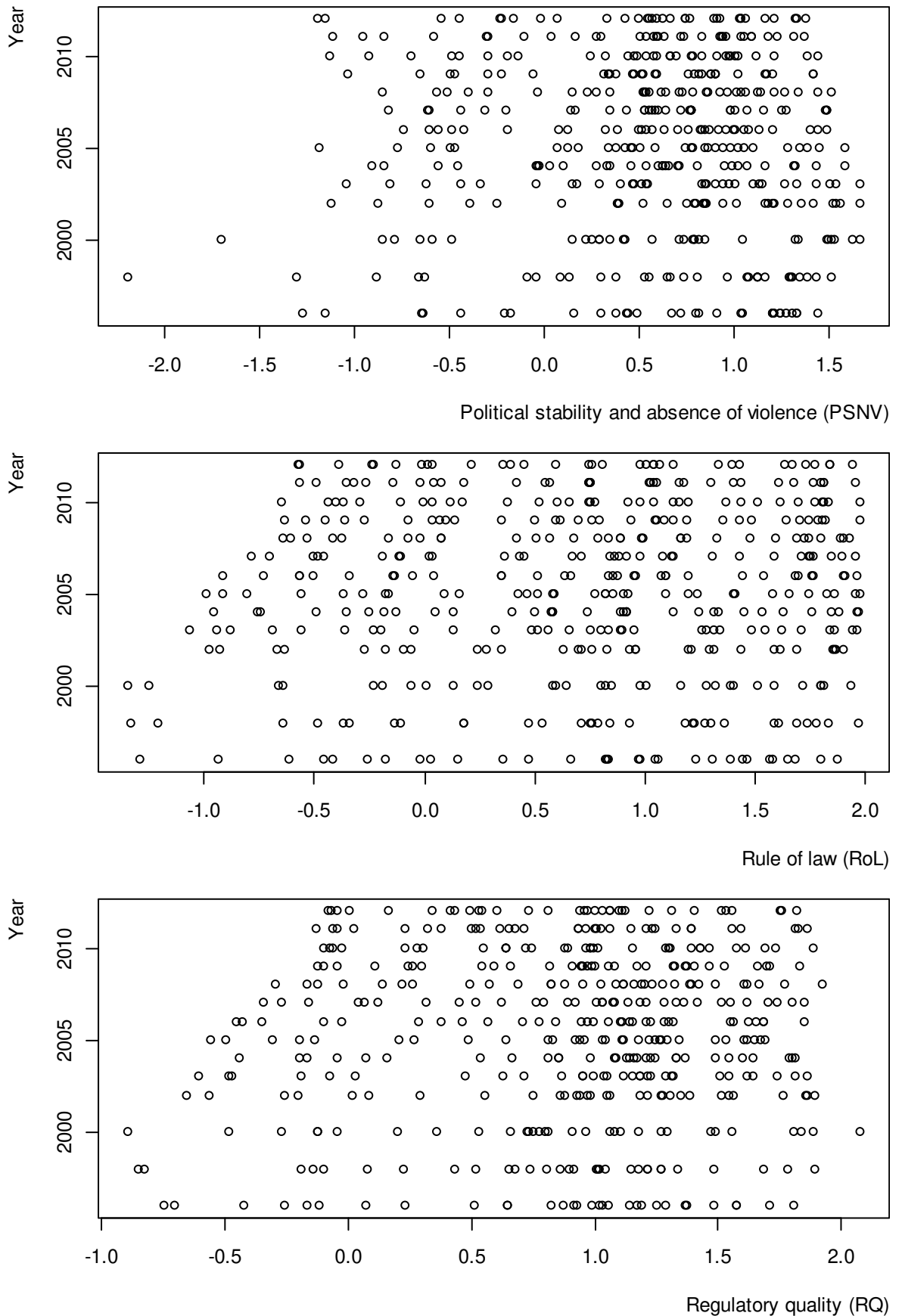


Figure 1 continued



Note: The figure displays the WGIs for 33 European countries from 1996 to 2012.

Table 4 displays the mean values of the WGI depending on the status. Unsurprisingly, the mean values of the indicators increase from PCEU to MBEA. As expected, the institutional development level is positively associated with the steps towards EU membership and the introduction of the euro. This is in line with the conditionality principle, as discussed in Section 2

Table 4 Mean values of the WGI depending on the status

	VaA	CoC	GE	PSNV	RoL	RQ
NO	0.02	0.22	0.3	0.01	0.13	0.25
PCEU	0.25	-0.23	-0.11	-0.1	-0.23	0.1
CCEU	0.54	0.2	0.4	0.23	0.29	0.58
ACEU	0.84	0.37	0.6	0.71	0.49	0.85
CCEA	0.99	0.65	0.89	0.77	0.86	1.07
MBEA	1.29	1.36	1.42	0.86	1.36	1.35

Table 5 displays the mean values of the first-differenced WGI, i.e. the year-to-year changes in the WGI, depending on the status. The evidence is not conclusive but there is a tendency for countries in the early stages of EU accession to have experienced greater improvements in the WGI than euro area members and Member States preparing to adopt the euro. For almost all the indicators, countries with the PCEU, CCEU and ACEU status experienced an improvement in their WGI. For most indicators, their average changes are considerably higher than the average changes of the control group NO. On the contrary, members of the euro area have negative or zero average changes in their WGI. The average changes are also quite small and partly negative for CCEA.

Table 5 Mean values of the first-differenced WGI depending on the status

	VaA	CoC	GE	PSNV	RoL	RQ
NO	0.0095	0.0065	0.0104	0.009	0.0093	0.0119
PCEU	0.0135	0.0317	0.0143	-0.0233	0.0411	0.0293
CCEU	0.0118	0.0047	0.0298	0.0188	0.0114	0.0242
ACEU	-0.0089	0.0941	0.0212	0.0627	0.0302	-0.0029
CCEA	-0.0129	0.0053	0.0138	-0.0107	0.0126	0
MBEA	-0.0054	-0.0195	-0.0188	-0.0194	-0.0053	-0.0009

Now we turn to the estimates of equation (1). Table 6 shows the results of six regressions; in each regression, one governance indicator is the dependent variable. The regressions are estimated by two-way within OLS. Panel robust standard errors allowing for heteroscedasticity across countries and serial correlation are reported.

Table 6 Two-way within OLS estimates with annual data

Explanatory variables	Dependent variable					
	VaA	CoC	GE	PSNV	RoL	RQ
lag(WGI)	0.8009 (0.0198) ***	0.7784 (0.0224) ***	0.7963 (0.036) ***	0.703 (0.0337) ***	0.8218 (0.0299) ***	0.7819 (0.0319) ***
lag(Status)PCEU	-0.0233 (0.0265)	0.0146 (0.0224)	0.0268 (0.0257)	0.0288 (0.0334)	0.0347 (0.0245)	0.0545 (0.0183) ***
lag(Status)CCEU	0.063 (0.0542)	0.0416 (0.0449)	0.1061 (0.0269) ***	0.0762 (0.0408) *	0.0383 (0.0263)	0.0455 (0.0414)
lag(Status)ACEU	0.1688 (0.0801) **	0.0379 (0.082)	0.0558 (0.0504)	0.0396 (0.0809)	0.0763 (0.0411) *	0.2065 (0.0751) ***
lag(Status)CCEA	0.0217 (0.0511)	0.0142 (0.0499)	0.0544 (0.0408)	0.0549 (0.0553)	0.0524 (0.0386)	0.0483 (0.0614)
lag(Status)MBEA	0.0098 (0.074)	-0.1302 (0.0618) **	0.0286 (0.0435)	-0.0844 (0.0728)	0.0329 (0.0341)	0.0675 (0.0645)
lag(GDP_per_capita_US)	-0.0353 (0.0317)	0.0415 (0.0378)	0.1253 (0.0408) ***	0.1929 (0.0598) ***	0.0929 (0.0379) **	0.1284 (0.0441) ***
lag(Trade)	0.0194 (0.0253)	0.0363 (0.0326)	0.0638 (0.0422)	0.1113 (0.0668) *	0.0648 (0.0279) **	0.0752 (0.0335) **
lag(WGI):lag(Status)PCEU	0.0052 (0.0446)	-0.0511 (0.0296) *	-0.076 (0.0282) ***	-0.0398 (0.0328)	-0.034 (0.0193) *	-0.0608 (0.04)
lag(WGI):lag(Status)CCEU	-0.1005 (0.0525) *	-0.111 (0.0255) ***	-0.1355 (0.0286) ***	-0.1255 (0.0358) ***	-0.0701 (0.0196) ***	-0.0534 (0.0527)
lag(WGI):lag(Status)ACEU	-0.2427 (0.083) ***	-0.0965 (0.118)	-0.1313 (0.0453) ***	-0.2096 (0.0847) **	-0.1695 (0.0435) ***	-0.213 (0.0719) ***
lag(WGI):lag(Status)CCEA	-0.0571 (0.0475)	-0.0284 (0.032)	-0.0155 (0.03)	-0.086 (0.0504) *	-0.0461 (0.025) *	-0.0521 (0.0579)
lag(WGI):lag(Status)MBEA	-0.0575 (0.0654)	0.0341 (0.043)	-0.0444 (0.0334)	-0.0351 (0.0539)	-0.0504 (0.0261) *	-0.0702 (0.0488)
r2/r2adj.	0.7318/0.6614	0.7094/0.6409	0.7265/0.6562	0.5898/0.5326	0.7831/0.7075	0.6934/0.6262

Notes: *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively; lag() denotes lagged one period; sample: 1996–2012, 56 countries, unbalanced panel because of data availability; two-way fixed-effects OLS estimator; panel robust standard errors are reported in parentheses.

We first discuss whether the status has any effect on the WGIs, which corresponds to the null-hypothesis $\beta_2 = \beta_3 = 0$. The F-tests on this null-hypothesis are presented in Table 7 for each regression and status variable. One can conclude that the status PCEU has a significant effect on the governance indicators GE and RQ at the 5% level and additionally on CoC and RoL at the 10% level. Being a candidate country or an acceding country significantly influences almost all WGIs. On the other hand, being a Member State preparing for the introduction of the euro or a euro area country does not influence the governance indicators. The only exception is effect of the status MBEA on CoC, which is significant at the 10% level.

Table 7 F-tests on linear hypotheses

Null-hypothesis	P-values of the F-tests on the six regressions					
	VaA	CoC	GE	PSNV	RoL	RQ
lag(Status)PCEU=0, lag(WGI):lag(Status)PCEU=0	0.5958	0.093	0.0218	0.2092	0.0665	0.0003
lag(Status)CCEU=0, lag(WGI):lag(Status)CCEU=0	0.1409	0	0	0.0008	0.0016	0.5176
lag(Status)ACEU=0, lag(WGI):lag(Status)ACEU=0	0.0085	0.7156	0.0126	0.012	0.0005	0.0108
lag(Status)CCEA=0, lag(WGI):lag(Status)CCEA=0	0.4127	0.6588	0.4117	0.2251	0.1583	0.6583
lag(Status)MBEA=0, lag(WGI):lag(Status)MBEA=0	0.3657	0.0848	0.4132	0.1477	0.1443	0.3561

Note: Estimates of panel robust covariance matrixes allowing for heteroskedasticity across countries and serial correlation are applied.

We proceed by interpreting the model both ways: first, when $Status_{t-1}$ is the conditioning variable; second, when WGI_{t-1} is the conditioning variable. Both statements are logically symmetric and cannot be distinguished when estimating an interaction model (Kam, Franzese 2005, p. 13; Brambor et al. 2006, p. 72). The first case allows for different intercepts and slopes for the level effect of the WGIs depending on the status. Table 6 shows that the WGIs are state-dependent for all six dimensions. The coefficients of the lagged dependent variables are within a range of 0.70 to 0.82 and highly significant. The coefficients of the status dummy variables are mostly positive, with a few exceptions, which corresponds to an upward intercept shift of the regression line (we call it the direct effect). The prospect for joining the EU has significant direct effects on the indicators VaA, GE and RQ: being a CCEU speeds up the development of GE, and being an ACEU contributes positively to VaA. Potential candidate countries and acceding countries experience an improvement in RQ. There are no significant direct effects for CCEA. For the indicator CoC, the coefficient of MBEA is negative and significant at the 5% level. Thus, there seems to be a direct negative effect of being a euro area country on CoC.

Candidate and acceding countries experience a significant reduction in institutional persistence for almost all the WGI's (which we call the indirect effect of the status). The coefficients of the interaction terms are negative and significant. For GE, the institutional persistence also decreases in potential candidate countries (for CoC and RoL, the significance is at the 10% level). In contrast, Member States preparing for the introduction of the euro and euro area countries hardly experience a significant influence on their institutional development path. The marginal effects of WGI_{t-1} on WGI_t depending on the status are shown in Table 8. The institutional persistence is the lowest for candidate and acceding countries.

Table 8 Marginal effects and hypothesis tests on whether WGI_{t-1} affects WGI

	VaA	CoC	GE	PSNV	RoL	RQ
PCEU=1	0.8061 (0.0474) ***	0.7273 (0.0377) ***	0.7203 (0.0453) ***	0.6633 (0.0321) ***	0.7878 (0.0367) ***	0.7211 (0.0332) ***
CCEU=1	0.7004 (0.0512) ***	0.6674 (0.0298) ***	0.6608 (0.0444) ***	0.5775 (0.0391) ***	0.7516 (0.0339) ***	0.7285 (0.0483) ***
ACEU=1	0.5582 (0.0848) ***	0.6819 (0.1191) ***	0.665 (0.0582) ***	0.4934 (0.0842) ***	0.6523 (0.0506) ***	0.5689 (0.0716) ***
CCEA=1	0.7439 (0.047) ***	0.75 (0.0355) ***	0.7808 (0.0326) ***	0.617 (0.0454) ***	0.7757 (0.0325) ***	0.7298 (0.0524) ***
MBEA=1	0.7434 (0.0636) ***	0.8125 (0.0453) ***	0.7519 (0.0267) ***	0.6679 (0.0468) ***	0.7714 (0.0265) ***	0.7117 (0.0418) ***

Notes: The table displays the conditional coefficient $dWGI_t/dWGI_{t-1}$ and the corresponding standard error (in parentheses). *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

In Table 6, we see that the control variable GDP per capita is positive and significant for most of the indicators, as expected. Trade is positive and significant for RoL and RQ at the 5% level and for PSNV at the 10% level.

Now, we evaluate the statement that the marginal effect of the status may depend on the level of the WGI's. For this, we calculated the standard errors and confidence intervals for the marginal effects of all the status variables depending on the previous year governance indicator. Figure 2 to Figure 7 illustrate how the marginal effect of $Status_{t-1}$ changes across a country's level in institutional development. The solid line shows the marginal effect of $Status_{t-1}$ depending on WGI_{t-1} and the dashed lines are the confidence intervals. From Figure 4, one can see that the effect of becoming a potential candidate country is statistically significant at conventional levels for relatively low institutionally developed countries (with government effectiveness below approx. -0.4). In contrast, there is no statistically significant effect for institutionally high-developed countries. It is useful to complement the insights of Table 6 and Figure 4 with a quantitative assessment of the impact of being a potential candidate country on the government effectiveness. Let us assume that Albania, whose government effectiveness indicator scored -0.80 in 1996, would have been a potential

candidate in 1996. This would have raised Albania's indicator score by 0.09 in 1997 holding other variables constant. Once the GE scores more than -0.4 , the effect of being a potential candidate on GE is not statistically significant different from zero any more.

Over all WGs, a quite homogenous picture emerges. Being a PCEU has a significant and positive effect on the improvement of four WGs when the institutional development level is low (below world average). The same applies to CCEU for slightly other WGs, but the marginal effect is as twice as large. For most WGs, the effect is even greater when a country is an acceding country to the EU. However, the standard errors are also considerably larger for ACEU. Moreover, potential candidates, candidates and acceding countries with relatively low developed institutions benefit the most from the EU accession process. In contrast, high institutionally developed potential candidates, candidates and acceding countries do not experience any significant improvement of their institutions because of the EU accession.

To better judge the substantive implication of the results, we provide boxplots of the sample for all WGs (Figure 8). By this, one can see approximately the percentage of the sample that falls within the region of significance. Around half of the observations for countries with the status NO and PCEU are located within the region, where marginal effects of PCEU, CCEU and ACEU are significant. Moreover, roughly 25% of the observations of candidate countries for the EU lie within this region. Hence, one can conclude that being a PCEU, CCEU or ACEU has a positive effect on institutional development.

The marginal effect of being a CCEA or an MBEA is insignificant for most WGs except for CoC. There is a significant negative marginal effect of being a member of the euro area on CoC if the indicator CoC of the previous year scores between -0.3 to 1.0 . This is of high policy relevance. For members of the euro area, around 25% of the observations fall within this range. In seven members of the euro area, the CoC indicator scores below one in 2012.¹³ 75% of the observations of Member States that have not yet introduced the euro lie below 1.0. All new Member States have an undersized control of corruption in 2012. They are all members of the EMU with derogation, and some of them recently introduced the euro.

To conclude, there is evidence that potential candidate, candidate and acceding countries perform better than the control group. In particular, prospective EU membership reduces the persistence of institutional development. There are virtually no differences in the

¹³ These countries are Greece, Italy, Malta, Portugal, Slovak Republic, Slovenia and Estonia.

performance of Member States preparing to adopt the euro, euro area members and the control group NO. The only exception is the negative impact of being an MBEA on CoC.

Figure 2 The marginal effect of $Status_{t-1}$ on VaA

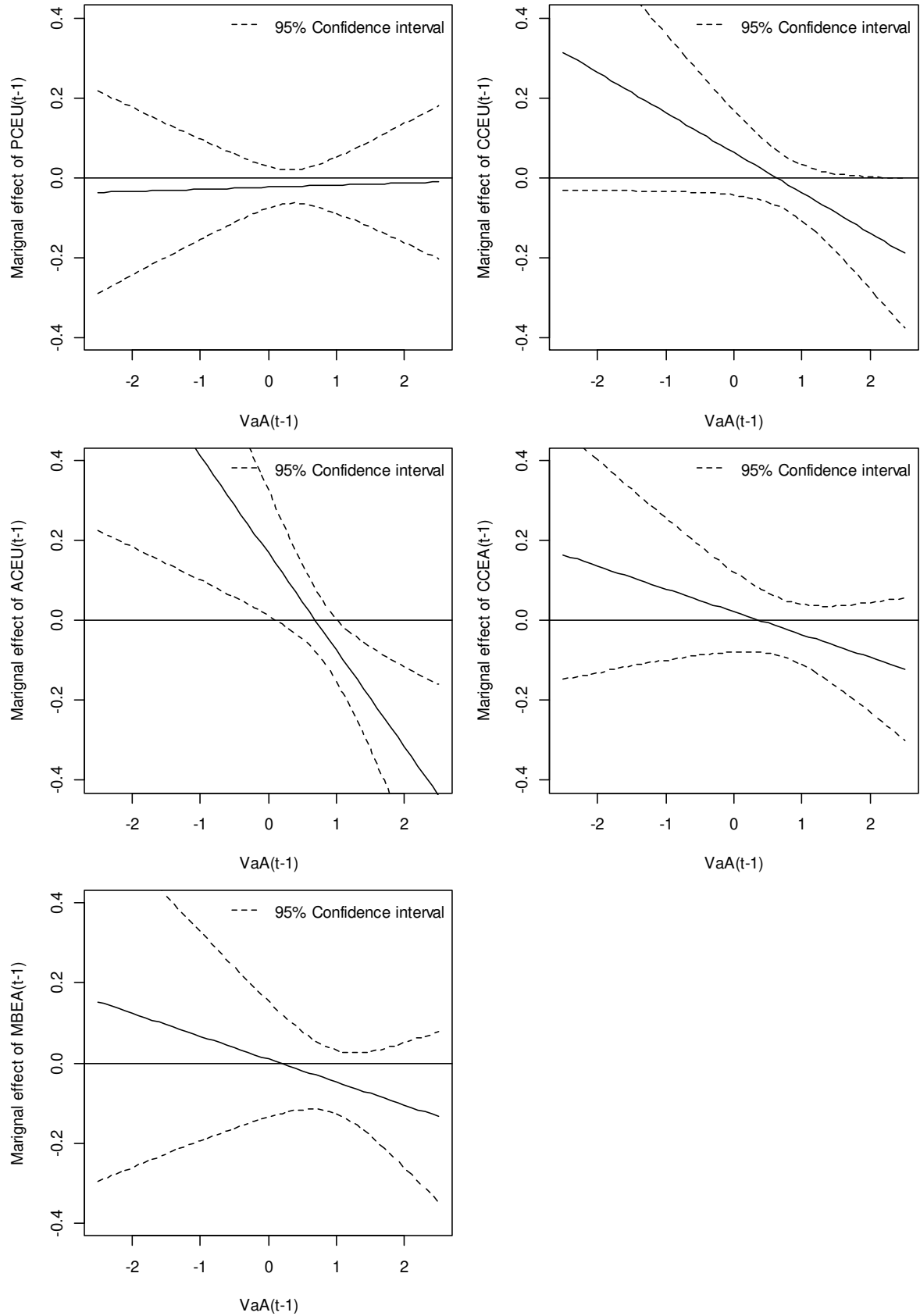


Figure 3 The marginal effect of $Status_{t-1}$ on CoC

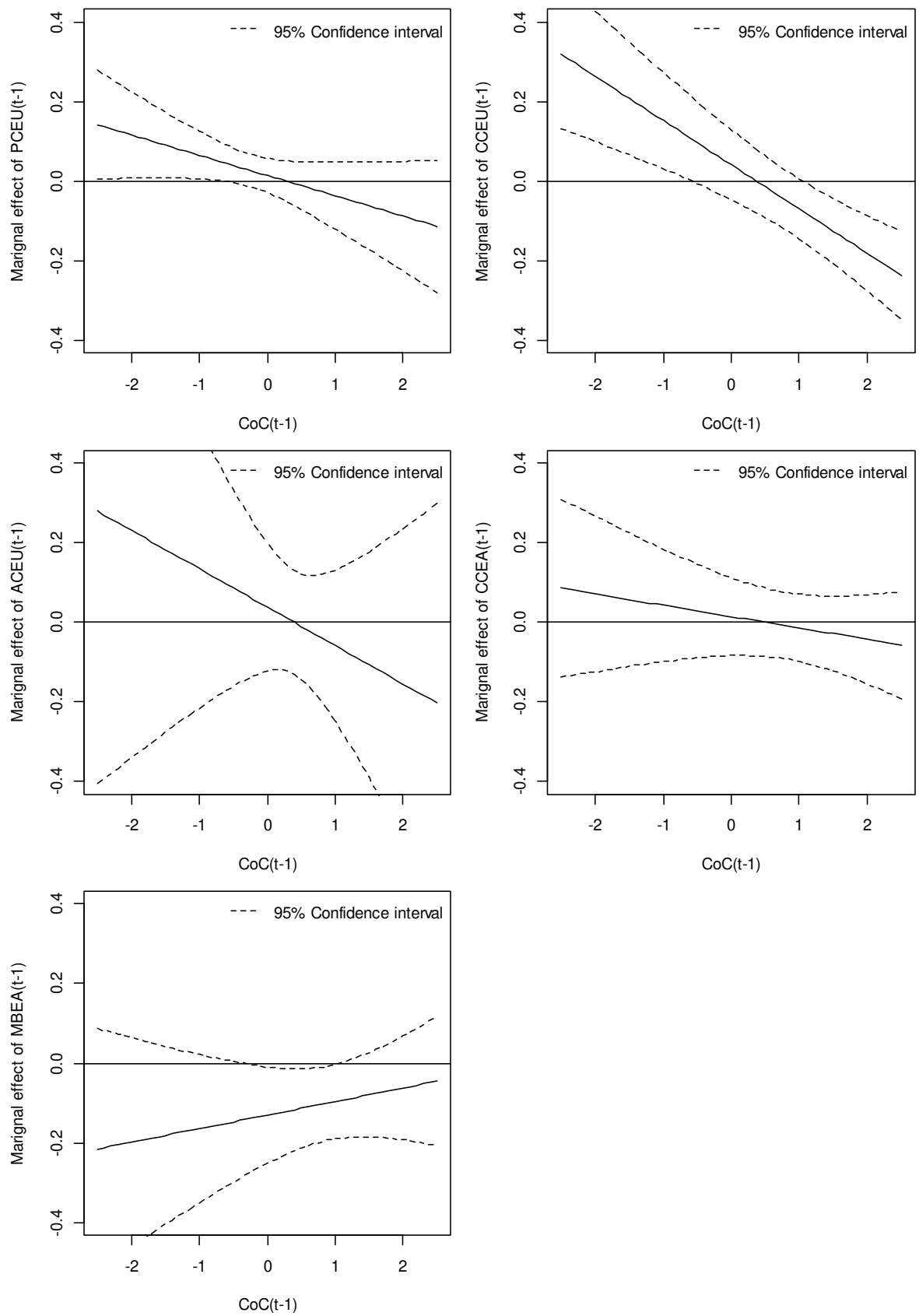


Figure 4 The marginal effect of $Status_{t-1}$ on GE

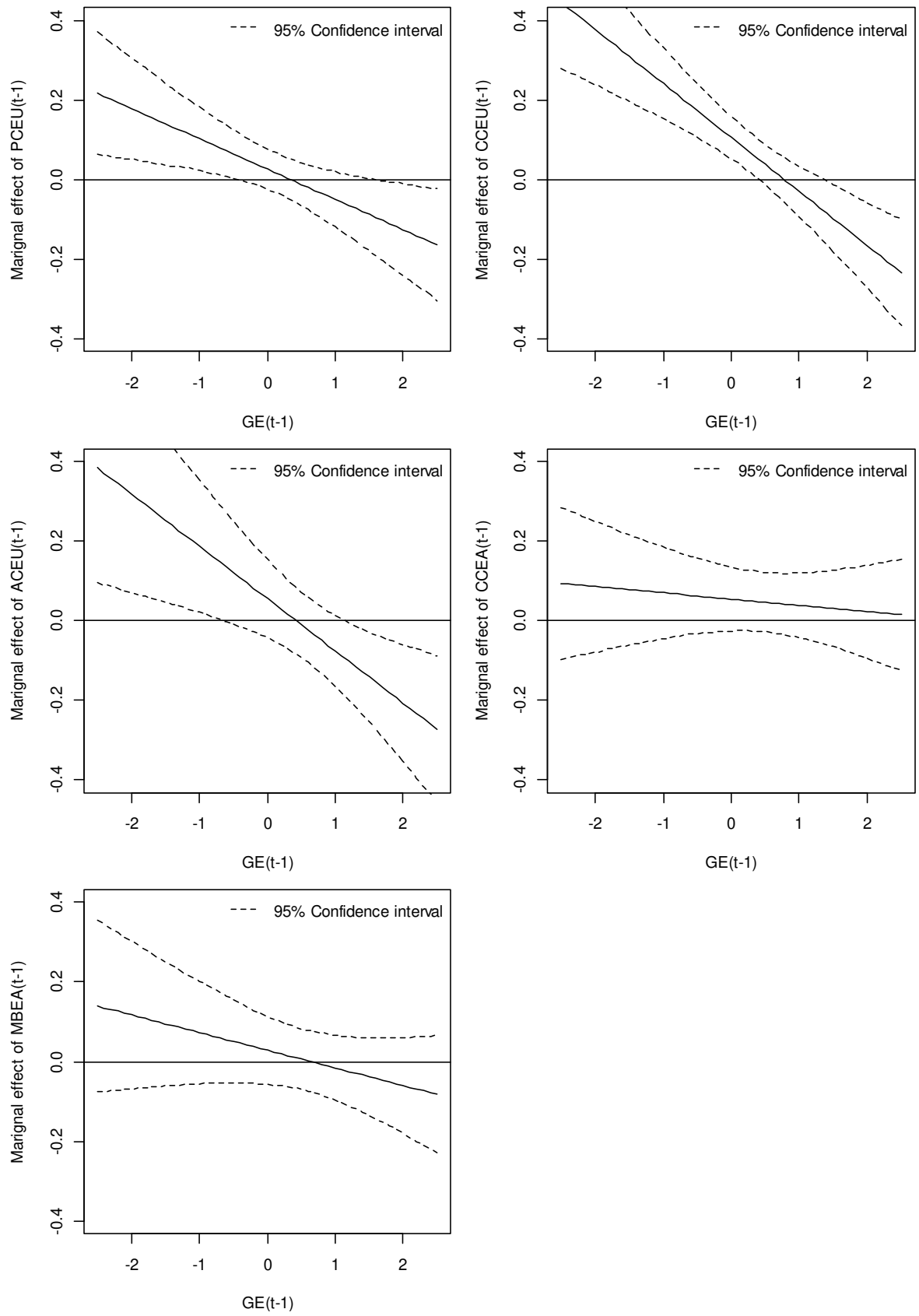


Figure 5 The marginal effect of $Status_{t-1}$ on PSNV

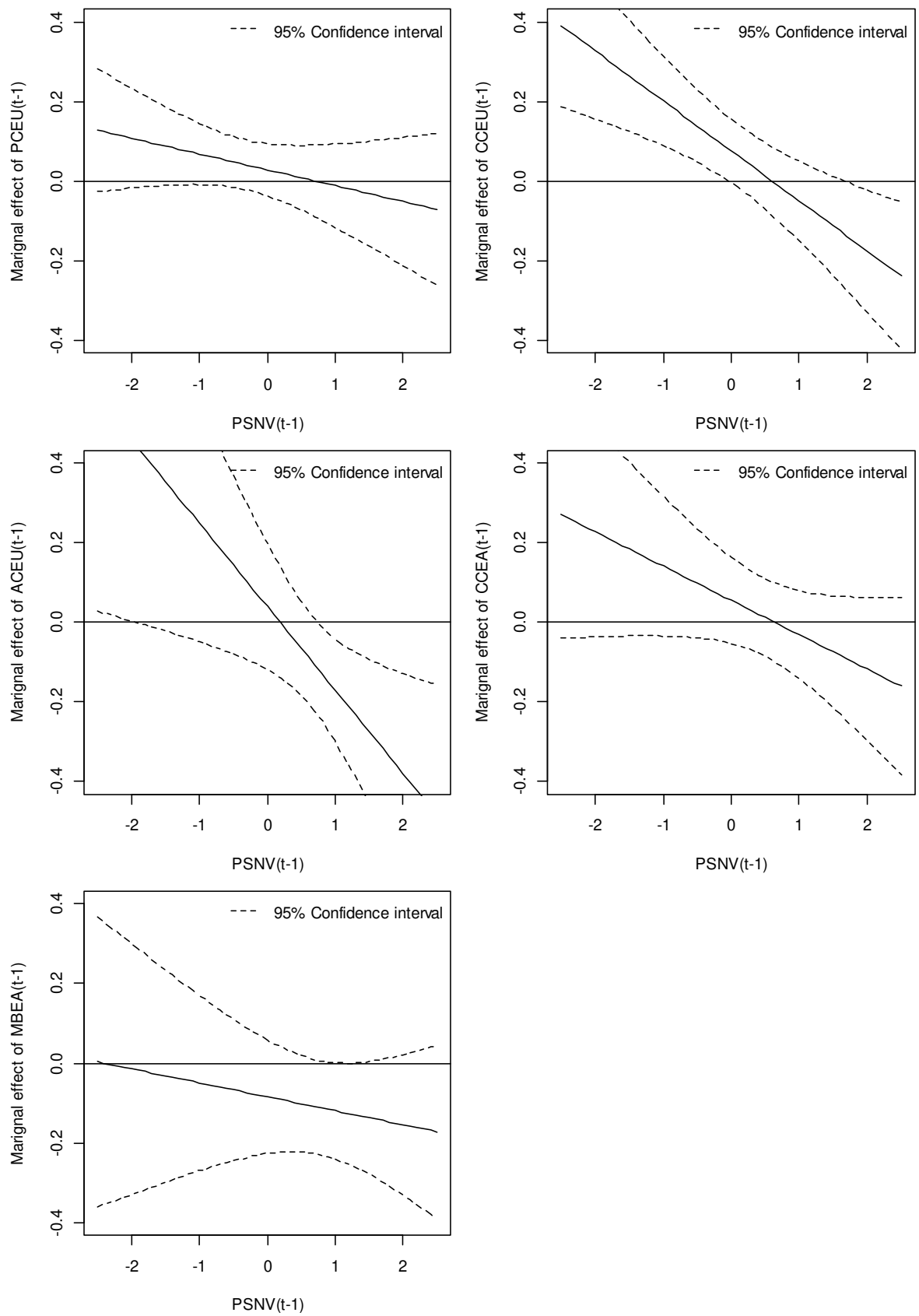


Figure 6 The marginal effect of $Status_{t-1}$ on RoL

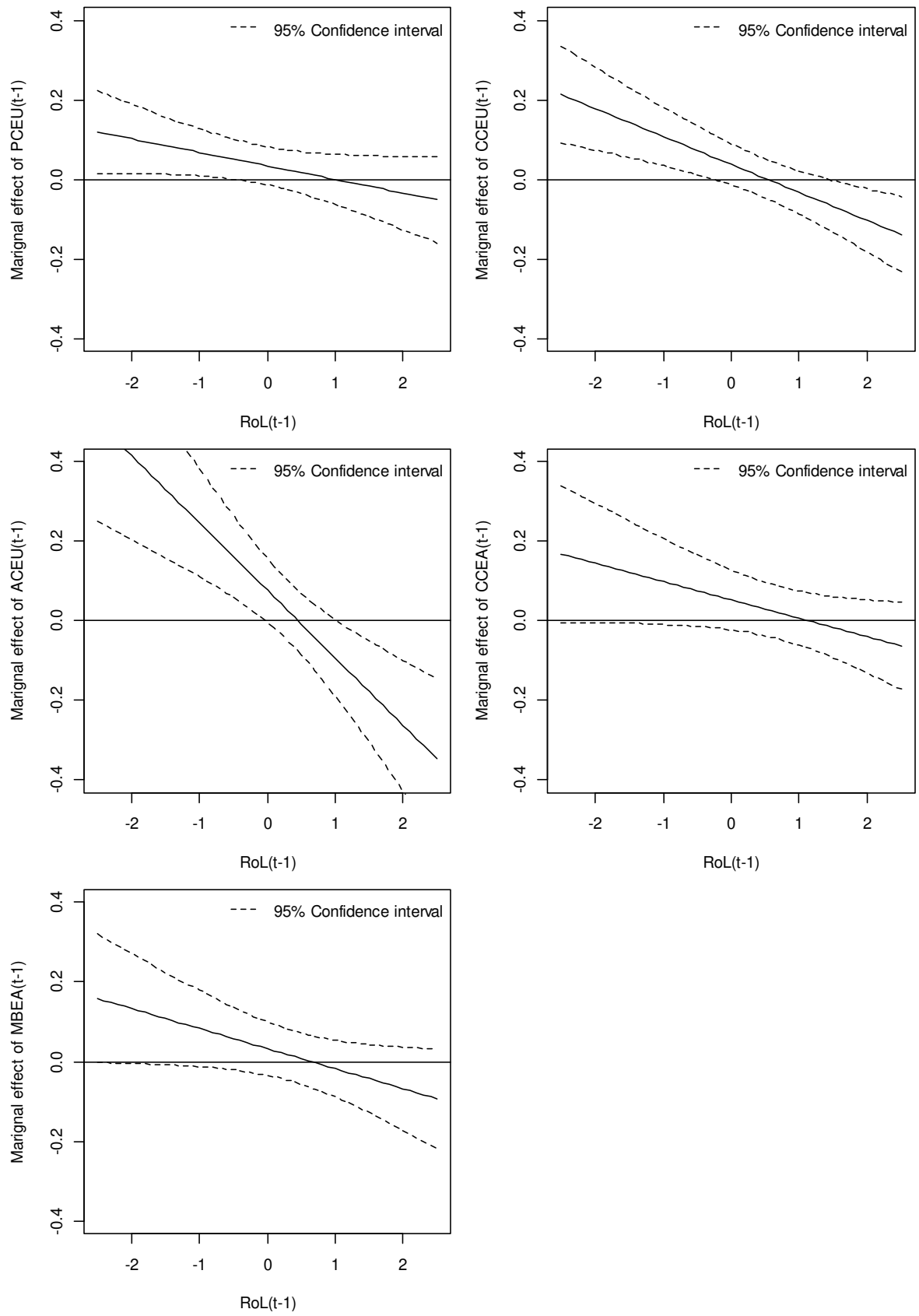


Figure 7 The marginal effect of $Status_{t-1}$ of RQ

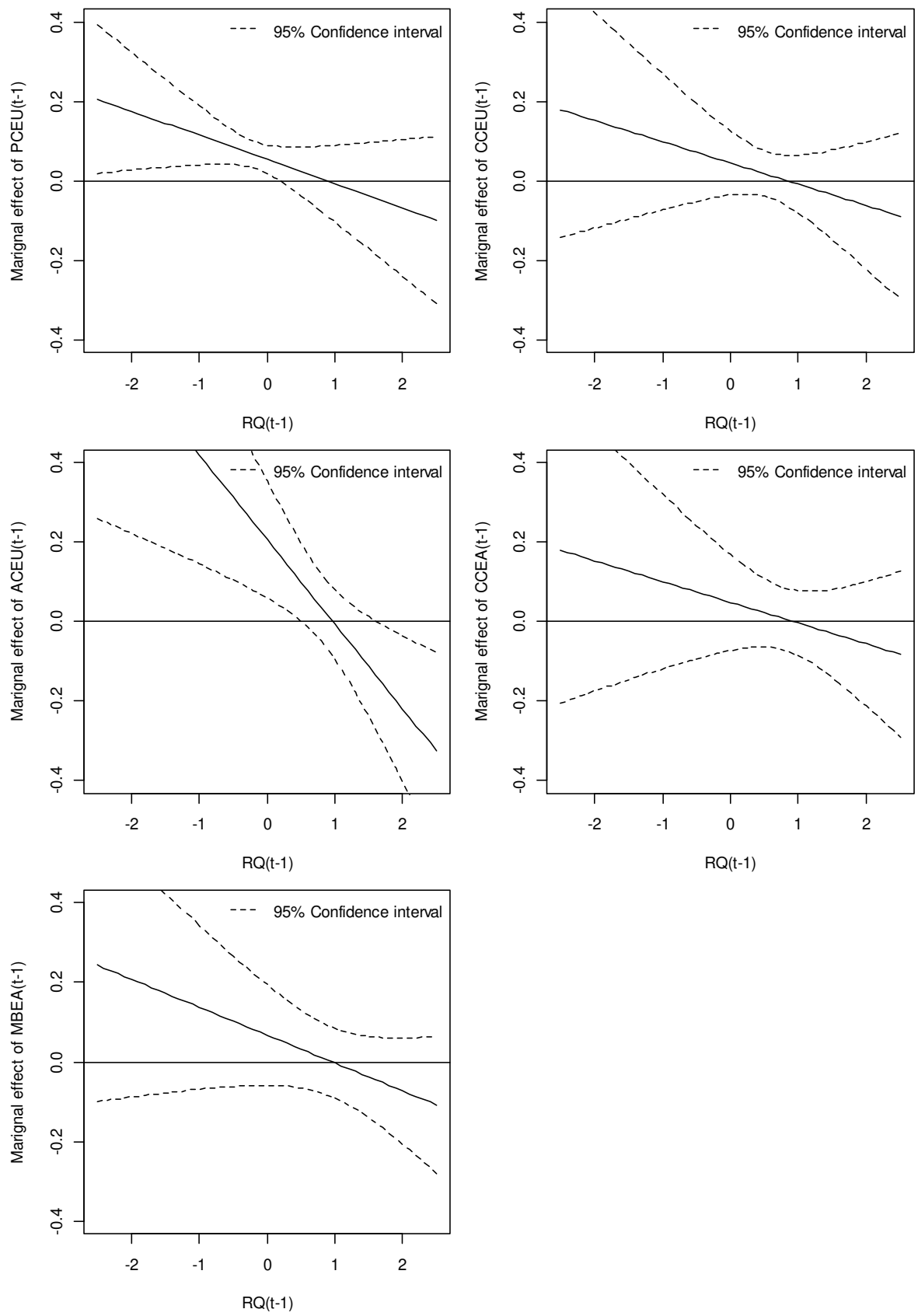
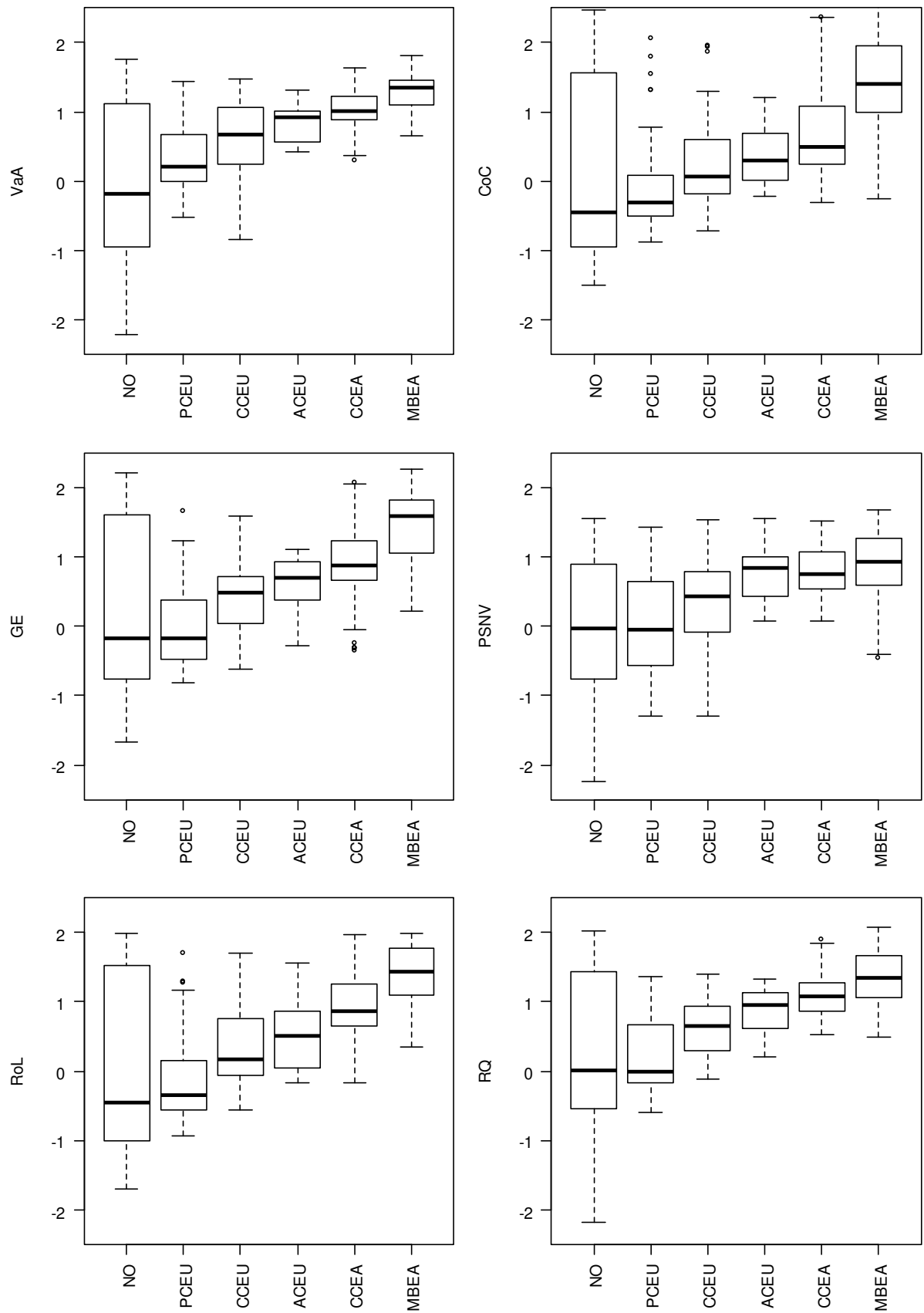


Figure 8 Boxplots of the sample: WGI_t grouped by the status variable



6 Robustness checks

To verify that our results are robust to model and data specifications, we re-estimate equation (1) firstly using biannual data and secondly splitting the sample in two, one part for the issue of EU accession and the other for the issue of the introduction of the euro.¹⁴ Additionally, we estimate equation (1) with biannual data using the Blundell–Bond system GMM. Our previous conclusions are largely confirmed.

The use of biannual data on the entire sample is motivated by the lack of WGI for the years 1997, 1999 and 2001. As discussed in Section 4.1, mean imputation could have an impact on the distribution of the WGIs and therefore could affect the covariances with other variables. Hence, we drop the information for the years 2003, 2005, 2007, 2009 and 2011 and use biannual data as a robustness check. Due to the small number of observations, we also have to merge the statuses ACEU and CCEU. The estimates and tests are presented in the appendix (Table 13). The results are quite similar to those of our main specification. The coefficients of the lagged dependent variables are now more strongly downward biased, as one would expect due to the Nickell bias. The prospect for joining the EU has positive direct effects on the speed of institutional development, which is significant for most indicators and particularly for CCEU. Now, even Member States preparing for the introduction of the euro experience positive direct effect on GE and RoL (significant at the 10% level). Again, being a member of the euro area is associated with significant impairment of CoC. With respect to the indirect effect of the status, one can confirm a reduction of persistence related to being a CCEU. This effect is highly significant for all the indicators except one. However, the bias of the coefficients of the endogenous and potentially weak exogenous variables is higher in a biannual setting as the number of periods diminishes to $T = 9$. It is possible to determine the direction of the bias for the coefficient of the lagged dependent variable but not for the other regressors. Therefore, we prefer to use annual data below.

The second way to confirm robustness is to split the sample into two, one part for the issue of EU accession and the other for the issue of the introduction of the euro. The first sample covers the new Member States, acceding countries, candidate countries, potential candidate countries and other European and Central Asian developing countries as defined by the

¹⁴ Additionally, we re-estimate this specification using trade with the EU and the euro area instead of the overall trade as a percentage of the GDP as we believe the directions of trade to be relevant to our setting. First, the former soviet countries displayed very tight and wide trade connections among each other just after the collapse of the Soviet Union. However, this hardly led to an “import” of good institutions. Second, the variables “trade with the EU” and “trade with the euro area” are probably more strongly correlated with the status of a country in the EU and the euro area than overall trade. However, the results basically do not change. They are available from the authors on request. The results of the basic estimation are displayed in the appendix (Table 17).

World Bank (Table 11). The statuses CCEA and MBEA are merged into the status “Member State of EU” (MBEU). The estimates and tests are present in the appendix (Table 14). They confirm the high persistence of the WGs, which is reduced by the prospect of entering the EU. Even being a Member State (MBEU) reduces the persistence of VaA, CoC and PSNV. However, there is little evidence of direct effects of status on the WGs; only a few coefficients are weakly significant. The effect of PCEU on RQ is at least jointly significant.

Concerning the introduction of the euro, the second sample covers all the euro area countries and other OECD countries (Table 12). There are just three statuses: NO, CCEA and MBEA. The high persistence of the WGs is confirmed as well as the negative direct effect of MBEA on CoC. The effect of the status CCEA on CoC is at least jointly significant. Moreover, being a CCEA increases the persistence of GE, which also applies to MBEA on GE and CoC. Finally, there is some indication that RoL could be more persistent for CCEA.

The use of biannual data reduces the number of observation periods from $T = 17$ to $T = 9$, which allows the application of the system GMM estimator as proposed by Blundell and Bond (1998). The system GMM estimator is particularly suited to short samples, in which the autoregressive parameter is moderately high. Moreover, system GMM allows the estimation of coefficients of time-invariant variables. Even though we do not have time-invariant variables in our specification, the use of the cross-section variation improves the estimation as the status dummy variables vary only a little over time. To avoid the problem of instrument proliferation, we restrict the instrument count as described by Roodman (2009), first by restricting the lags to be used for instruments instead of using all the available lags and second by “collapsing” the instrument matrix. The estimates, significance and specification tests are reported in Table 16. The GMM results are very weak for the indicators PSNV and RQ, for which the coefficients of the status variables and the interaction terms are all insignificant. Regarding the membership in the euro area, the negative impact on CoC is again confirmed. The GMM results also show a significant negative impact of being a euro area member on RoL. In contrast, we see a positive influence of being a member of the euro area on the development of VaA. By and large, the GMM results confirm our previous conclusions.

7 Conclusion

In this paper, we investigated the speed and direction of institutional development induced by European integration. We can confirm a positive effect of EU enlargement on institutional development. The positive effect of EU enlargement operates mainly through breaking the path dependence of institutional development. Hence, we can confirm the results of the empirical literature on transition countries of Central and Eastern Europe.

The novel finding of this paper is that once countries have become EU Member States or even introduced the euro, their institutional development loses momentum. The worries that new Member States could quickly reverse their reforms are not supported empirically. However, we have robust evidence that members of the euro area underperform in one particular area of institutional development, namely control of corruption.

References

- Alesina, Alberto; Ardagna, Silvia; Galasso, Vincenzo (2010): The Euro and Structural Reforms. In *Review of Economics and Institutions* 2 (1), pp. 1–37.
- Ballabriga, Fernando; Martinez-Mongay, Carlos (2007): A further inquire about the sustainability of fiscal policy in the EU. In Martin Larch, João Nogueira Martins (Eds.): Fiscal indicators. Proceedings from the Directorate-General for Economic and Financial Affairs Workshop, Brussels, 22 September 2006. Brussels: Europ. Comm. Directorate-General for Economic and Financial Affairs (European Economy – Economic papers, 297), pp. 17–55.
- Baltagi, Badi H. (2008): Econometric analysis of panel data. 4th ed. Chichester, West Sussex: Wiley.
- Bayar, Ali; Smeets, Bram (2009): Economic, political and institutional determinants of budget deficits in the European Union. München (CESifo Working Papers, 2611).
- Bean, Charles R. (1998): The interaction of aggregate-demand policies and labour market reform. In *Swedish Economic Policy Review* 5 (2), pp. 353–382.
- Beck, Thorsten; Laeven, Luc (2006): Institution building and growth in transition economies. In *Journal of Economic Growth* 11 (2), pp. 157–186.
- Belke, Ansgar; Herz, Bernhard; Vogel, Lukas (2007): Reforms, Exchange Rates and Monetary Commitment: A Panel Analysis for OECD Countries. In *Open Economies Review* 18 (3), pp. 369–388.
- Belke, Ansgar; Vogel, Lukas (2012): Monetary commitment and structural reforms. A dynamic panel analysis for transition economies. Deutsches Institut für Wirtschaftsforschung (Discussion papers, 1221).
- Berglöf, Erik; Burkart, Mike; Friebe, Guido; Paltseva, Elena (2008): Widening and Deepening: Reforming the European Union. In *The American Economic Review* 98 (2), pp. 133–137.
- Berglöf, Erik; Burkart, Mike; Friebe, Guido; Paltseva, Elena (2012): Club-in-the-club: Reform under unanimity. In *Journal of Comparative Economics* 40 (3), pp. 492–507.
- Berglöf, Erik; Roland, Gérard (1997): The EU as an "outside anchor" for transition reforms. Stockholm (SITE working paper, 132).
- Blundell, Richard W.; Bond, Stephen R. (1998): Initial conditions and moment restrictions in dynamic panel data models. In *Journal of Econometrics* 87 (1), pp. 115–143.
- Brambor, Thomas; Clark, William Roberts; Golder, Matt (2006): Understanding Interaction Models: Improving Empirical Analyses. In *Political Analysis* 14 (1), pp. 63–82.
- Brücker, Herbert; Schröder, Philipp J. H.; Weise, Christian (2005): Can EU Conditionality Remedy Soft Budget Constraints in Transition Countries? In *Journal of Comparative Economics* 33 (2), pp. 371–386.
- Cameron, Adrian Colin; Trivedi, Pravin K. (2007): Microeconometrics. Methods and applications. reprint. Cambridge: Cambridge Univ. Press.
- Croissant, Yves; Millo, Giovanni (2008): Panel Data Econometrics in R: The plm Package. In *Journal of Statistical Software* 27 (2), pp. 1–43.
- Crombrughe, Alain de; Minton-Beddoes, Zanny; Sachs, Jeffrey (1996): EU Membership for Central Europe: Commitments, Speed, and Conditionality. Harvard Institute for International Development. Cambridge, Mass. (Working Papers, 523).
- Deutsche Bundesbank (2012): The financial crisis and balance of payments developments within the euro area. In *Monthly Report* 64 (10), pp. 13–27.

- Di Tommaso, Maria L.; Raiser, Martin; Weeks, Melvyn (2007): Home Grown or Imported? Initial Conditions, External Anchors and the Determinants of Institutional Reform in the Transition Economies. In *The Economic Journal* 117 (520), pp. 858–881.
- Dixit, Avinash K. (2008): Economic Governance. In Steven N. Durlauf, Lawrence E. Blume (Eds.): *The New Palgrave Dictionary of Economics*. Basingstoke: Palgrave Macmillan. Available online at http://www.dictionaryofeconomics.com/extract?id=pde2008_E000260.
- Dollar, David; Kraay, Aart (2003): Institutions, trade, and growth. In *Journal of Monetary Economics* 50 (1), pp. 133–162.
- Drazen, Allan (2000): *Political economy in macroeconomics*. Princeton, NJ: Princeton Univ. Press.
- Duval, Romain; Elmeskov, Jørgen (2005): The Effects of EMU on Structural Reforms in Labour and Product Markets. Organisation for Economic Co-operation and Development (OECD Economics Department Working Papers, 438).
- Eijffinger, Sylvester C. W.; Stadhouders, Patrick (2003): Monetary policy and the rule of law. Centre for Economic Policy Research (CEPR Discussion Paper Series, 3698).
- European Central Bank (2011): *The European Central Bank, The Eurosystem, The European System of Central Banks*. Available online at http://www.ecb.eu/pub/pdf/other/escb_web_2011en.pdf?ce1ae83f168a8c88450c3e7aac3283f3, checked on 4/12/2012.
- European Central Bank (2012): *Convergence Report*. Frankfurt am Main. Available online at <http://www.ecb.int/pub/pdf/conrep/cr201205en.pdf>, checked on 22/08/2012.
- European Commission (2003): *Enlargement of the European Union. An historic opportunity*. European Commission, Enlargement Directorate-General. Brussels. Available online at <http://bookshop.europa.eu/en/enlargement-of-the-european-union-pbNIXX03001/?CatalogCategoryID=3vgKABstSD8AAAEj4IUY4e5K>, checked on 4/12/2012.
- European Commission (2012): *Enlargement*. European Commission, Directorate General for Enlargement. Available online at http://ec.europa.eu/enlargement/index_en.htm, checked on 4/12/2012.
- European Council (22/06/1993): *European Council in Copenhagen 21-22 JUNE 1993. Conclusions of the Presidency*. Reference: DOC/93/3. Copenhagen. Available online at http://europa.eu/rapid/press-release_DOC-93-3_en.htm, checked on 3/04/2013.
- European Council (2012): *Conclusions from 2002 to 1993*. Available online at <http://www.european-council.europa.eu/council-meetings/conclusions/archives-2002-1993>, checked on 4/12/2012.
- European Union (29/07/1992): *Treaty on European Union*. In *Official Journal of the European Communities* (C 191), pp. 1–110.
- European Union (2012): *EUROPA - European Union website, the official EU website. How the EU works, Countries*. Edited by Communication department of the European Commission. Available online at http://europa.eu/about-eu/countries/index_en.htm, checked on 4/12/2012.
- Fernández-Villaverde, Jesús; Garicano, Luis; Santos, Tano (2013): Political Credit Cycles: The Case of the Eurozone. In *Journal of Economic Perspectives* 27 (3), pp. 145–166.
- Fox, John; Weisberg, Sanford (2011): *An R Companion to Applied Regression*. 2nd ed. Thousand Oaks CA: Sage.
- Galli, Emma; Padovano, Fabio (2008): Sustainability and determinants of Italian public deficits before and after Maastricht. In Reinhard Neck, Jan-Egbert Sturm (Eds.): *Sustainability of public debt*. Cambridge, Mass.: MIT Press (CESifo seminar series), pp. 51–83.

- Gleich, Holger (2003): Budget institutions and fiscal performance in Central and Eastern European Countries. European Central Bank. Frankfurt am Main (Working Paper Series, 215).
- Greene, William H. (2000): *Econometric analysis*. 4th ed. Upper Saddle River: Prentice-Hall International.
- International Monetary Fund (2013): Direction of Trade Statistics (DOTS). Available online at <http://www.imf.org/external/data.htm>, checked on 23/08/2013.
- Kam, Cindy D.; Franzese, Robert J. (2005): Modeling and interpreting interactive hypotheses in regression analysis. A Refrecher and Some Pactical Advice. University of Michigan Press. Available online at http://investigadores.cide.edu/aparicio/data/Kam%26Franzese_InterpretingInteractionsinRegressions_05.pdf, checked on 7/01/2015.
- Kaufmann, Daniel; Kraay, Aart; Mastruzzi, Massimo (2007): The Worldwide Governance Indicators Project: Answering the Critics. World Bank. Washington, DC (Policy Research Working Paper, 4149).
- Kaufmann, Daniel; Kraay, Aart; Mastruzzi, Massimo (2010): The Worldwide Governance Indicators. Methodology and Analytical Issues. World Bank. Washington, DC (Policy Research Working Paper, 5430).
- Kaufmann, Daniel; Kraay, Aart; Mastruzzi, Massimo (2013): The Worldwide Governance Indicators (WGI) project. World Bank. Available online at <http://info.worldbank.org/governance/wgi/index.aspx#home>, updated on 20/09/2013, checked on 22/10/2013.
- Kochenov, Dimitry (2008): EU enlargement and the failure of conditionality. Pre-accession conditionality in the fields of democracy and the rule of law. Austin: Kluwer Law International; Wolters Kluwer (European monographs, 59).
- Krugman, Paul R. (1991): History versus Expectations. In *The Quarterly Journal of Economics* 106 (2), pp. 651–667.
- Liikanen, Erkki (2005): After enlargement: institutional achievements and prospects in the new Member States. Comment. In Carsten Detken, Vítor Gaspar, Gilles Noblet (Eds.): *The New EU Member States Convergence and Stability*. Third ECB Central Banking Conference. Frankfurt am Main, 21-22 October 2004. European Central Bank, pp. 59–62.
- Mattli, Walter; Plümper, Thomas (2004): The Internal Value of External Options. How the EU Shapes the Scope of Regulatory Reforms in Transition Countries. In *European Union Politics* 5 (3), pp. 307–330.
- Mink, Mark; Haan, Jakob de (2005): Has the stability and growth pact impeded political budget cycles in the European Union? Munich (CESifo working paper series, 1532).
- Nickell, Stephen (1981): Biases in Dynamic Models with Fixed Effects. In *Econometrica* 49 (6), pp. 1417–1426.
- North, Douglass C. (1981): *Structure and change in economic history*. New York NY: Norton.
- North, Douglass C. (1990): *Institutions, institutional change and economic performance*. 28th ed. Cambridge: Cambridge Univ. Press.
- R Core Team (2012): *R: A Language and Environment for Statistical Computing*. Version 2.15.2 (2012-10-26). Vienna, Austria: R Foundation for Statistical Computing. Available online at <http://www.R-project.org/>, checked on 12/05/2013.
- Rigobon, Roberto; Rodrik, Dani (2005): Rule of law, democracy, openness, and income. In *Economics of Transition* 13 (3), pp. 533–564.
- Roland, Gérard (2000): *Transition and economics*. Cambridge, Mass: MIT Press (Comparative institutional analysis, 1).

- Roland, Gérard; Verdier, Thierry (2003): Law enforcement and transition. In *European Economic Review* 47 (4), pp. 669–685.
- Roodman, David (2009): A Note on the Theme of Too Many Instruments. In *Oxford Bulletin of Economics and Statistics* 71 (1), pp. 135–158.
- Saint-Paul, Gilles; Bentolila, Samuel (2001): Will EMU increase eurosclerosis? In Charles Wyplosz (Ed.): *The impact of EMU on Europe and the developing countries. A study prepared for the World Institute for Development Economics Research of the United Nations University (UNU/WIDER)*. Oxford: Oxford Univ. Press (UNU/WIDER studies in development economics), pp. 128–168.
- Schweickert, Rainer; Melnykovska, Inna; Belke, Ansgar; Bordon, Ingo (2011): Prospective NATO or EU membership and institutional change in transition countries. In *The Economics of Transition* 19 (4), pp. 667–692.
- Staehr, Karsten (2011): Democratic and Market-Economic Reforms in the Postcommunist Countries: The Impact of Enlargement of the European Union. In *Eastern European Economics* 49 (5), pp. 5–28.
- Weber, Steven (1995): European Union conditionality. In Barry J. Eichengreen (Ed.): *Politics and institutions in an integrated Europe*. Berlin: Springer, pp. 193–220.
- Windmeijer, Frank (2005): A finite sample correction for the variance of linear efficient two-step GMM estimators. In *Journal of Econometrics* 126 (1), pp. 25–51.
- World Bank (2012): *World Development Indicators (WDI)*. Washington, DC. Available online at <http://data.worldbank.org/data-catalog/world-development-indicators>, updated on 21/12/2012, checked on 30/11/2012.
- Zeileis, Achim; Hothorn, Torsten (2002): Diagnostic Checking in Regression Relationships. In *R News* 2 (3), pp. 7–10.

Appendix

Table 9 Control variables

Variable	Description	Source
GDP_per_capita_US	GDP per capita in US dollars in logarithms	(World Bank 2012)
Trade	Trade (% of GDP) in logarithms	(World Bank 2012)
Trade.to.EA.GDP	Trade with the euro area (% of GDP) in logarithms	(International Monetary Fund 2013)
Trade.to.EU.GDP	Trade with the EU (% of GDP) in logarithms	(International Monetary Fund 2013)
Trade.to.EU.excl.EA.GDP	Trade with the EU exclusive of the euro area (% of GDP) in logarithms	(International Monetary Fund 2013)

Table 10 Countries of the whole sample

ALBANIA	GREECE	NETHERLANDS
ARMENIA	HUNGARY	NEW ZEALAND
AUSTRALIA	ICELAND	NORWAY
AUSTRIA	IRELAND	POLAND
AZERBAIJAN	ISRAEL	PORTUGAL
BELARUS	ITALY	ROMANIA
BELGIUM	JAPAN	RUSSIAN FEDERATION
BOSNIA AND HERZEGOVINA	KAZAKHSTAN	SERBIA
BULGARIA	KOREA, REP.	SLOVAK REPUBLIC
CANADA	KOSOVO	SLOVENIA
CHILE	KYRGYZ REPUBLIC	SPAIN
CROATIA	LATVIA	SWITZERLAND
CYPRUS	LITHUANIA	TAJIKISTAN
CZECH REPUBLIC	LUXEMBOURG	TURKEY
ESTONIA	MACEDONIA, FYR	TURKMENISTAN
FINLAND	MALTA	UKRAINE
FRANCE	MEXICO	UNITED STATES
GEORGIA	MOLDOVA	UZBEKISTAN
GERMANY	MONTENEGRO	

Table 11 Countries of the EU sample

ALBANIA	HUNGARY	ROMANIA
ARMENIA	KAZAKHSTAN	RUSSIAN FEDERATION
AZERBAIJAN	KOSOVO	SERBIA
BELARUS	KYRGYZ REPUBLIC	SLOVAK REPUBLIC
BOSNIA AND HERZEGOVINA	LATVIA	SLOVENIA
BULGARIA	LITHUANIA	TAJIKISTAN
CROATIA	MACEDONIA, FYR	TURKEY
CYPRUS	MALTA	TURKMENISTAN
CZECH REPUBLIC	MOLDOVA	UKRAINE
ESTONIA	MONTENEGRO	UZBEKISTAN
GEORGIA	POLAND	

Table 12 Countries of the EA sample

AUSTRALIA	GREECE	NEW ZEALAND
AUSTRIA	IRELAND	NORWAY
BELGIUM	ISRAEL	PORTUGAL
CANADA	ITALY	SLOVAK REPUBLIC
CHILE	JAPAN	SLOVENIA
CYPRUS	KOREA, REP.	SPAIN
ESTONIA	LUXEMBOURG	SWITZERLAND
FINLAND	MALTA	UNITED STATES
FRANCE	MEXICO	
GERMANY	NETHERLANDS	

Table 13 Two-way within OLS estimates with biannual data

Explanatory variables	Dependent variable					
	VaA	CoC	GE	PSNV	RoL	RQ
lag(WGI)	0.474 (0.037) ***	0.5148 (0.0465) ***	0.6133 (0.0611) ***	0.2881 (0.0642) ***	0.587 (0.0648) ***	0.4713 (0.0664) ***
lag(Status)PCEU	0.0564 (0.0469)	0.0332 (0.0663)	0.0364 (0.0457)	0.081 (0.1057)	0.0851 (0.0389) **	0.0931 (0.0364) **
lag(Status)CCEU	0.2364 (0.0853) ***	0.0946 (0.1033)	0.1865 (0.0471) ***	0.1832 (0.097) *	0.0909 (0.0399) **	0.0977 (0.0762)
lag(Status)CCEA	0.1348 (0.0969)	0.0489 (0.1094)	0.1269 (0.0712) *	0.1037 (0.1322)	0.113 (0.0584) *	0.0565 (0.1091)
lag(Status)MBEA	0.0585 (0.1256)	-0.2698 (0.1239) **	0.058 (0.083)	-0.2083 (0.1647)	0.0215 (0.0607)	0.1134 (0.1397)
lag(GDP_per_capita_US)	-0.0732 (0.0667)	0.0788 (0.0738)	0.1885 (0.0663) ***	0.4788 (0.1108) ***	0.1811 (0.066) ***	0.2602 (0.0862) ***
lag(Trade)	0.0492 (0.054)	0.0562 (0.07)	0.1008 (0.0827)	0.1251 (0.105)	0.0993 (0.0593) *	0.1068 (0.0701)
lag(WGI):lag(Status)PCEU	-0.0164 (0.0807)	-0.1013 (0.07)	-0.0441 (0.0529)	-0.0538 (0.077)	-0.0109 (0.0478)	-0.0016 (0.0718)
lag(WGI):lag(Status)CCEU	-0.2252 (0.0666) ***	-0.2334 (0.0509) ***	-0.2312 (0.0514) ***	-0.2956 (0.0723) ***	-0.1214 (0.0358) ***	-0.0584 (0.1002)
lag(WGI):lag(Status)CCEA	-0.1035 (0.0881)	-0.0705 (0.0563)	-0.0161 (0.0565)	-0.0894 (0.1001)	-0.0405 (0.041)	-0.0095 (0.1069)
lag(WGI):lag(Status)MBEA	-0.0633 (0.1092)	0.0738 (0.0624)	-0.0675 (0.0632)	0.0345 (0.1013)	-0.0173 (0.0474)	-0.0894 (0.1024)
r2/r2adj.	0.3632/0.3017	0.4089/0.3393	0.5512/0.4572	0.2963/0.2457	0.5422/0.45	0.3643/0.302

Notes: *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively; lag() denotes lagged one period; sample: 1996–2012, biannual, 56 countries, unbalanced panel because of data availability; two-way fixed-effects OLS estimator; panel robust standard errors are reported in parentheses.

Table 14 Two-way within OLS estimates with annual data and EU sample

Explanatory variables	Dependent variable					
	VaA	CoC	GE	PSNV	RoL	RQ
lag(WGI)	0.8364 (0.0226) ***	0.8358 (0.0319) ***	0.816 (0.0526) ***	0.7175 (0.0425) ***	0.8529 (0.0329) ***	0.7576 (0.0507) ***
lag(Status)PCEU	-0.0446 (0.0256) *	-0.0555 (0.0397)	-0.0067 (0.0446)	-0.0043 (0.0438)	0.0152 (0.0455)	0.0513 (0.0316)
lag(Status)CCEU	0.0489 (0.052)	-0.0435 (0.0608)	0.0579 (0.0445)	0.0375 (0.0585)	0.0217 (0.0449)	0.0269 (0.0463)
lag(Status)ACEU	0.0678 (0.0675)	-0.0433 (0.0962)	-0.0051 (0.066)	-0.0287 (0.0882)	0.0605 (0.0605)	0.1727 (0.0911) *
lag(Status)MBEU	0.0066 (0.0519)	-0.0839 (0.0664)	0.0044 (0.0584)	0.0419 (0.0777)	0.0423 (0.0577)	0.0013 (0.0741)
lag(GDP_per_capita_US)	-0.0689 (0.0389) *	-0.0656 (0.0529)	0.0186 (0.045)	0.1259 (0.088)	0.0888 (0.0634)	0.0759 (0.0569)
lag(Trade)	0.0107 (0.0361)	0.0218 (0.0355)	0.0271 (0.0438)	0.1146 (0.0724)	0.0605 (0.0286) **	0.09 (0.0404) **
lag(WGI):lag(Status)PCEU	-0.1014 (0.059) *	-0.1092 (0.0535) **	-0.0988 (0.0618)	-0.0613 (0.0498)	-0.0566 (0.0476)	-0.0158 (0.0558)
lag(WGI):lag(Status)CCEU	-0.2097 (0.0671) ***	-0.1913 (0.047) ***	-0.1587 (0.0678) **	-0.178 (0.0496) ***	-0.1076 (0.0491) **	0.0011 (0.0621)
lag(WGI):lag(Status)ACEU	-0.2085 (0.0771) ***	-0.1715 (0.1347)	-0.1491 (0.0673) **	-0.1908 (0.0969) **	-0.2121 (0.0654) ***	-0.1691 (0.0834) **
lag(WGI):lag(Status)MBEU	-0.191 (0.0711) ***	-0.1749 (0.0592) ***	-0.09 (0.0591)	-0.2099 (0.0824) **	-0.0881 (0.0489) *	-0.0003 (0.0704)
r2/r2adj.	0.7693/0.679	0.7459/0.6578	0.6857/0.6043	0.5479/0.4825	0.7895/0.6963	0.7009/0.6176

Notes: *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively; lag() denotes lagged one period; sample: 1996–2012, 31 countries, unbalanced panel because of data availability; two-way fixed-effects OLS estimator; panel robust standard errors are reported in parentheses.

Table 15 Two-way within OLS estimates with annual data and EA sample

Explanatory variables	Dependent variable					
	VaA	CoC	GE	PSNV	RoL	RQ
lag(WGI)	0.7747 (0.0347) ***	0.6895 (0.0403) ***	0.5858 (0.0718) ***	0.6716 (0.0324) ***	0.6972 (0.0499) ***	0.758 (0.0265) ***
lag(Status)CCEA	0.0632 (0.0855)	0.0191 (0.0538)	-0.1047 (0.0743)	0.0696 (0.0712)	-0.005 (0.0224)	-0.0243 (0.07)
lag(Status)MBEA	0.0015 (0.0713)	-0.1306 (0.0448) ***	-0.1213 (0.0731) *	-0.0599 (0.0668)	-0.0394 (0.0343)	0.0191 (0.0619)
lag(GDP_per_capita_US)	-0.0287 (0.0489)	0.0757 (0.1241)	0.2107 (0.0843) **	0.0723 (0.1144)	0.1723 (0.0774) **	0.0177 (0.072)
lag(Trade)	0.0586 (0.0292) **	0.0279 (0.0788)	0.2416 (0.0403) ***	0.0867 (0.0827)	0.0397 (0.0372)	0.0566 (0.0655)
lag(WGI):lag(Status)CCEA	-0.0319 (0.0759)	0.0479 (0.0448)	0.224 (0.0696) ***	-0.0346 (0.0645)	0.0417 (0.0225) *	0.0433 (0.0582)
lag(WGI):lag(Status)MBEA	0.0014 (0.0642)	0.1151 (0.0449) **	0.1714 (0.0711) **	0.0322 (0.06)	0.0494 (0.0305)	0.0002 (0.0461)
r2/r2adj.	0.6308/0.5593	0.6327/0.561	0.6848/0.6071	0.513/0.4549	0.699/0.6197	0.602/0.5338

Notes: *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively; lag() denotes lagged one period; sample: 1996–2012, 28 countries, unbalanced panel because of data availability; two-way fixed-effects OLS estimator; panel robust standard errors are reported in parentheses.

Table 16 Blundell–Bond system GMM estimates

Explanatory variables	Dependent variable					
	VaA	CoC	GE	PSNV	RoL	RQ
lag(WGI)	0.8467 (0.0994) ***	0.7871 (0.1017) ***	0.7546 (0.0635) ***	0.4909 (0.1158) ***	0.8522 (0.0553) ***	0.7771 (0.0693) ***
lag(StatusPCEU)	0.19 (0.0727) ***	-0.0681 (0.0692)	0.0063 (0.0448)	-0.2821 (0.2684)	0.0673 (0.0397) *	0.0152 (0.0634)
lag(StatusCCEU)	0.1487 (0.0897) *	-0.0319 (0.076)	0.0687 (0.0425)	-0.0606 (0.1307)	0.0261 (0.0393)	0.1052 (0.0665)
lag(StatusCCEA)	0.2164 (0.1218) *	-0.1615 (0.0969) *	-0.004 (0.0639)	-0.1104 (0.1819)	0.0091 (0.0408)	0.0433 (0.1362)
lag(StatusMBEA)	0.324 (0.1202) ***	-0.3387 (0.1324) **	-0.1807 (0.1112)	-0.2382 (0.2121)	-0.155 (0.0702) **	0.0396 (0.2049)
lag(WGI*StatusPCEU)	-0.3812 (0.1601) **	-0.1621 (0.0803) **	-0.1063 (0.0692)	-0.0838 (0.2259)	0.0646 (0.047)	0.0402 (0.0944)
lag(WGI*StatusCCEU)	-0.1818 (0.077) **	-0.1548 (0.063) **	-0.1779 (0.0426) ***	-0.2096 (0.1343)	-0.0449 (0.0373)	-0.0973 (0.0909)
lag(WGI*StatusCCEA)	-0.238 (0.1395) *	0.0638 (0.0642)	0.0235 (0.0513)	-0.0554 (0.1729)	0.0332 (0.0375)	-0.0043 (0.1152)
lag(WGI*StatusMBEA)	-0.309 (0.1376) **	0.1419 (0.0781) *	0.0308 (0.0776)	-0.1165 (0.1759)	0.0801 (0.0465) *	-0.051 (0.1566)
lag(GDP_per_capita_US)	0.1444 (0.0769) *	0.1802 (0.0914) **	0.2012 (0.06) ***	0.3164 (0.1014) ***	0.1084 (0.0492) **	0.1319 (0.0405) ***
lag(Trade)	0.0758 (0.1347)	0.0623 (0.1213)	0.0612 (0.094)	0.5914 (0.1894) ***	0.0662 (0.0651)	0.1317 (0.126)
Hansen–Sargan test of overid. restrictions	0.2463	0.6601	0.7754	0.146	0.3602	0.1831
Arellano–Bond test for AR(1) in first differences	0.0005	0.0004	0	0	0	0
Arellano–Bond test for AR(2) in first differences	0.0488	0.1123	0.4584	0.3768	0.1083	0.4384

Notes: System GMM (Blundell, Bond 1998) with Windmeijer (2005) finite-sample correction for standard errors. Lags 2 to 4 are used as instruments. The Arellano–Bond test for AR(2) in first differences is rejected for VaA and PSNV in this specification (p -values: 0.0137 for VaA, 0.0780 for PSNV). Therefore, we restrict the instruments to lags 3 to 5 for VaA and PSNV. The Arellano–Bond test for AR(3) in first differences is not rejected thereafter for VaA and PSNV. Number of instruments: 51 for VaA and PSNV and 52 for the other WGI. Included exogenous variables (time dummies) are counted as instruments. The Hansen–Sargan test for joint validity of the instruments does not reject the null hypothesis for all the WGIs.

Table 17 Two-way within OLS estimates with annual data and directions of trade

Explanatory variables	Dependent variable					
	VaA	CoC	GE	PSNV	RoL	RQ
lag(WGI)	0.7953 (0.0206) ***	0.7707 (0.0231) ***	0.7964 (0.0412) ***	0.6667 (0.03) ***	0.8093 (0.0361) ***	0.7763 (0.0349) ***
lag(Status)PCEU	-0.0103 (0.0326)	0.0082 (0.0221)	0.0209 (0.024)	0.0247 (0.0323)	0.0482 (0.0221) **	0.0566 (0.0198) ***
lag(Status)CCEU	0.0709 (0.0522)	0.0362 (0.0441)	0.0925 (0.0247) ***	0.0681 (0.0422)	0.0473 (0.0271) *	0.0398 (0.042)
lag(Status)ACEU	0.1911 (0.0816) **	0.027 (0.0817)	0.0415 (0.0493)	0.0212 (0.0804)	0.0862 (0.0419) **	0.1939 (0.0765) **
lag(Status)CCEA	0.0404 (0.0559)	0.0033 (0.0479)	0.0383 (0.0394)	0.0326 (0.0628)	0.0609 (0.0389)	0.0287 (0.0624)
lag(Status)MBEA	0.0249 (0.0779)	-0.1421 (0.0597) **	0.0165 (0.0465)	-0.0863 (0.0783)	0.0317 (0.035)	0.055 (0.0663)
lag(GDP_per_capita_US)	-0.0328 (0.0321)	0.0423 (0.0381)	0.122 (0.0359) ***	0.2239 (0.0578) ***	0.0921 (0.0382) **	0.1234 (0.0421) ***
lag(Trade.to.EA.GDP)	-0.0345 (0.0192) *	0.0119 (0.0116)	-0.0221 (0.0165)	-0.0396 (0.0275)	0.0109 (0.0127)	0.0097 (0.0148)
lag(Trade.to.EU.excl.EA.GDP)	0.0046 (0.0172)	0.0158 (0.0142)	0.0278 (0.0195)	0.0578 (0.0278) **	0.0148 (0.0165)	0.0297 (0.0158) *
lag(WGI):lag(Status)PCEU	0.0018 (0.0531)	-0.0497 (0.0303)	-0.0633 (0.0268) **	0.017 (0.0326)	-0.0451 (0.0194) **	-0.0578 (0.0431)
lag(WGI):lag(Status)CCEU	-0.0964 (0.0519) *	-0.1065 (0.0251) ***	-0.1222 (0.0278) ***	-0.0722 (0.0378) *	-0.0714 (0.0216) ***	-0.0443 (0.0528)
lag(WGI):lag(Status)ACEU	-0.2593 (0.0848) ***	-0.0914 (0.118)	-0.1156 (0.0415) ***	-0.1546 (0.0818) *	-0.1718 (0.0443) ***	-0.2005 (0.0717) ***
lag(WGI):lag(Status)CCEA	-0.0602 (0.051)	-0.0189 (0.0314)	-0.0063 (0.0304)	-0.0304 (0.0479)	-0.0465 (0.0264) *	-0.0363 (0.0577)
lag(WGI):lag(Status)MBEA	-0.0557 (0.0659)	0.0429 (0.0419)	-0.0369 (0.0357)	0.0073 (0.0522)	-0.0428 (0.0279)	-0.0633 (0.0507)
r2/r2adj.	0.6981/0.6294	0.6998/0.6309	0.7235/0.6523	0.571/0.5147	0.7714/0.6954	0.688/0.6202

Notes: *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively; lag() denotes lagged one period; sample: 1996–2012, 55 countries, unbalanced panel because of data availability; no data on direction of trade for Kosovo available; two-way fixed-effects OLS estimator; panel robust standard errors are reported in parentheses.