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The International Spillover Effects of Political Transitions

Yaroslava Babych

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International School of Economics at Tbilisi State University
16 Zandukeli Street, Tbilisi 0108, Georgia
www.iset.ge

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Yaroslava Babych
International School of Economics at
Tbilisi State University (ISET)
16 Zandukeli Street, 0180
Tbilisi, Georgia
e-mail: y.babych@iset.ge

Abstract

Why do political transitions to more representative forms of government are often associated with vastly different outcomes for different countries? This paper examines the possibility of cross-country "political spillovers", testing in particular whether countries surrounded by relatively more autocratic neighbors also experience a more difficult economic adjustment process following democratization. The dynamic fixed effects model, estimated using the pooled mean group estimator methodology of Pesaran, Shin and Smith (1999) allows to account for both short and long-run effects of political spillovers between neighboring countries. In particular, the paper finds evidence that for countries which have experienced democratization, moving away from their neighborhoods on the political spectrum implies slower GDP per capita growth in the long run.

Section I. Introduction

Economic literature much attention has been given to the democracy-growth nexus. The question of whether democracy is good for growth, whether democratic countries on average grow faster than their autocratic counterparts dates back to the 1960s.[1] Yet in recent years there has been a revival of interest in the topic. Economists are increasingly interested in the link between the quality of country's institutions and growth outcomes. Quality of political system in particular is seen as one of the most important parts of the overall institutional structure.

Moreover, since the end of the Cold War and the advent of globalization the world has seen profound changes in both political and economic structure in the countries of Eastern Europe, Asia, Latin America. These changes brought to the fore important questions: does globalization, trade, financial openness and technology spillovers help promote representative systems of government? Why did some countries experience political reversals from more representative forms of government (e.g. Belarus), and some others have found it challenging to maintain a fragile democracy against the possibility of such reversals (e.g. Ukraine, Georgia)? And, in turn, what are the likely growth consequences for the countries that have undergone such political transformations?

While it is too early to draw conclusions from these events, the historical data could provide us with valuable insights into the nature of the costs that countries face when they undergo political transformations, and how such costs could shape the path of the country's development.

Section II. Literature Review

The main purpose of this chapter is to investigate how political transitions impact countries' short and long run growth outcomes. In particular I am interested in whether countries surrounded by relatively more autocratic neighbors/trading partners are likely to grow slower as a result of democratic transitions than their counterparts in more democratic

[1] Huntington, Samuel, *Political Order in Changing Societies.* New Haven: Yale University Press 1968
also de Schweinitz, Karl Jr., *Industrialization and Democracy.* New York: Free Press, 1964

neighborhoods. On the other hand, I would also like to assess how a country's economic growth responds to the political transitions in the neighboring countries.

The question is important in part because empirical studies tend to report a positive, yet often a weak or inconclusive link between emergence of representative political institutions and economic growth.

For example, in a widely cited 1993 survey, Przeworski and Limongi examined 11 studies and 21 findings, of which 8 had found evidence in favor or democracy's positive impact on growth, 8 had found the evidence against, and 5 results had been inconclusive. Since the P&L survey, various authors have re-examined the problem of democracy-growth nexus by expanding the time frame of their sample, employing panel data techniques and trying to control for simultaneity bias between democracy and growth variables.

This research effort has produced a body of evidence, which points to a positive link between democratic political institutions and economic growth. Yet, the outcomes largely depend upon the model specification and definition of 'democratization'. In one such study, Branko Milanovic (2006) employs a dynamic panel regression, where the dependent variable is GDP per capita growth rate averaged over 5 year non-overlapping periods. The country's Polity[2] score is one of the dependent variables.

Milanovic finds that a 1 point increase in the country's polity score is associated with 0.1 percent increase in the GDP per capita growth rate, and the effect of democratization increases as income per capita levels rise.

In the same paper, however, the results from a different model specification (using annual observations on growth rates, rather than 5 year averages) suggest that an increase in country's Polity score has a negative effect on growth.

In a related paper, Rodrik and Wacziarg (2005) ask whether democratic regime changes produce bad outcomes[3], and conclude that democratic changes have overall a positive *short run* effect (the results suggest that in the first 5 years following a democratization

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[2] Polity score is a measure of democratization employed by most of the studies outlined below. More precise definition in Marshall, Monty G. and Keith Jaggers. *Polity IV Dataset [Computer File; Version p4v2001]*. College Park, MD: Center for International Development and Conflict Management, University of Maryland, 2002.

[3] The authors use panel fixed effects model on the sample of 154 countries from 1950-2000.

episode, countries on average grow 0.87 percent faster than their counterparts, which experienced no regime change). In the same time, the *long run* effects of democratic regime changes are positive but insignificant.[4]

Rodrik and Wacziarg results contrast with the findings of Papaioannou and Siourounis (2005) [5]. The authors of the study, which uses a somewhat different definition of democratization[6], examine long run growth effects of permanent political regime changes in a dynamic panel fixed effects model. They conclude that permanent democratizations are associated with about 0.7 percent increase in the long run growth rates.

A number of researchers, however, have pointed out that the effect of democratization on growth may potentially be underestimated. One of the reasons is significant heterogeneity in the countries' experience with democratization. Or, simply put, political transitions to more representative forms of government are often associated with very different growth outcomes for different countries.

For example, Milanovic (2005) study estimates a series of growth regressions with the measure of democratization as a dependent variable for 118 countries, using data from 1820 to 2000. The paper reports that the distribution of country-specific coefficients is very wide. Of total 118 coefficients, slightly more than half are statistically significant, and 70% of those are positive. The mean group estimator of the slopes is not significantly different from zero. The author concludes that assigning the same coefficient value to all countries seriously underestimates the variability of the growth outcomes resulting from democratic transitions.

Persson and Tabellini (2007) also argue that heterogeneity among countries in one of the main reasons why the effect of democracy on growth appears to be small. They re-estimate the average effect of political transition on economic growth by using a difference-in-difference method, which assesses the pre and post-reform growth outcomes for different countries.

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[4] These results may be in part due to the fact that democratization usually follows a period of economic downturn. The spurs of growth in the first 5 years after democratization, likely reflect the recovery from a bad shock rather than growth gains.

[5] The authors rely on growth, investment and Polity data for 67 to 112 countries from 1960-2000

[6] "Democratization" in their definition is not a continuous index, but a dummy variable equal to 1 for countries with a positive Polity score, and zero otherwise.

In their analysis the authors use propensity score matching technique to give more weight to the comparison of countries that are similar in the probability of experiencing a democratic reform.

The political similarity between countries (their propensity to experience democratic reforms) is estimated as a function of per capita income and two "democratic capital" variables – the "domestic democratic capital" – length of country's own experience with democracy - and "foreign democratic capital" – the prevalence of democratic regimes among the country's neighbors. These variables are found to be significant predictors of whether the country will develop representative political system in the future or not (Persson and Tabellini (2006)).

Persson and Tabellini's research is particularly interesting, as it points in the direction of why some countries' experience with democratic reforms may be different from that of other countries with similar characteristics.

Most researchers estimate the effect of democracy on growth without taking into account the possibility that a country surrounded by autocratic neighbors may grow slower - even after a successful political transition - than a country surrounded by established democracies. In the same time, political transitions in other countries in the immediate neighborhood could also affect the country's own growth outcomes.

Due to these complex political spillover effects, the average economic impact of democratization in a panel of countries may be close to zero.

Section III. Methodology

3.1 Measuring Political Distance between countries

To what extent does the change in the political distance between countries affect their growth and contribute to the heterogeneity in the countries experience with democratization? To address this question we need a measure political distance between the country and its neighborhood.

Let us first consider the case of two neighboring countries i and j[7].

[7] In this chapter I will rely on the polity score index (from Polity IV database) as an indicator of the how representative the country's political institutions are.

For a simple measure I consider the absolute value of the difference between the polity scores for each country. Thus, the $\mathbf{A_{i.t.}}$ the *absolute political distance* between the countries i and j in each year is:

$$A_{ij.t.} = |Polity_{i.t.} - Polity_{j,t}| \quad (2.1)$$

Suppose country i undergoes political regime change in the year T*. The country i will then be considered to have moved away from country j on the political spectrum, if the average absolute political distance in the 5 years after the transition is greater than the same distance in the 5 years before the political transition has taken place.

The country is considered to have moved politically closer to its region if the average absolute political distance in the 5 years after the year T* is less than in the 5 years before the T*. More specifically, I define variable $Z_{ij,t}$ the *change in the absolute political distance* between countries i and j as follows:

$$Z_{ij,t} = \sum_{n=0}^{4} A_{ij,t+n} - \sum_{n=1}^{5} A_{ij,t-n} \quad (2.2)$$

A higher value of $Z_{ij,t}$, means that the country has on average moved further away from the country j in the 5 year period, and the lower value of $Z_{ij,t}$ would indicate that the country i has moved politically closer to country j[8].

In order to extend this measure to the political neighborhood of country i, we need to define the 'neighborhood' in a way suitable to the purposes of historical analysis. On one hand, we can consider the 'neighborhood' to be a historically defined group such as Western Europe, Eastern Europe, Latin America, etc. However, the membership in regional groups is subject to change over time. Therefore, the more historically appropriate measure of political distance would treat all the countries in the sample as the neighborhood of the country i., and use the great circle distance between countries as weights. Therefore, the measure of country's *absolute political distance* from its neighbors takes the following form:

$$A_{i.t} = | Polity_{i,t} - (\Sigma_j Polity_{j,t}*(1/\omega_t^{i,j}))/ \Sigma(1/\omega^{i,j}) | \quad (2.3)$$

Where $\boldsymbol{\omega_t^{i,j}}$ is the geographical distance weight, equal to the great circle distance of country i from country j. $Z_{i,t}$ is consequently defined as:

[8] During any given period of time t when country i is not experiencing a political transitions, the value of $Z_{ij,t}$ would measure the extent to which a political transition in the country j is affecting the absolute political distance between the two countries.

$$Z_{i,t} = \sum_{n=0}^{4} A_{i,t+n} - \sum_{n=1}^{5} A_{i,t-n} \qquad (2.4)$$

Figures 2.1-2.5 illustrate the absolute political distance change ($Z_{i,t}$) for a number of countries. The country's own Polity and the neighborhood (world) Polity graphs are also presented for comparison.

The proposed measure of political distance and political distance change has an advantage over the Persson and Tabellini's measure of "foreign democratic capital" in that it captures *relative* political distance between countries, taking into account the fact that in the 19th century most countries in the world were not democratic by modern standards. Most had polity scores below zero.

3.2 Strategies for estimating long and short run spillover effects of political transitions

In order to assess the effect of democratization on growth as well as the role of political spillovers, it is necessary to account for the possibility of both the short and the long-run effects of the political transitions.

Methodologies used to identify the impact of democratization range from cross-country regressions (e.g. Barro (1991), Tavares and Wacziarg (2001)) to dynamic panel estimations. The cross-sectional approach (used mainly in the earlier studies) may be less adequate in historical contexts, when a single country's coefficients are likely to be changing over time. Also, as Rodrik and Wacziarg (2005) have pointed out, cross-sectional approach could be useful only in identifying a long-run impact of the regressors.

In light of these considerations, most studies have relied on the time-series cross-sectional data from a large number of countries to account for both short and long run effects, and consequently have employed dynamic fixed effects methods (Milanovic (2005), Rodrick and Wacziarg (2005), Papaioannou and Siourounis(2005))[9]. In these models, however, the short and long run effects have been estimated separately, with short run effects ordinarily captured with the dummies around the times of the transition.

[9] The semi-parametric difference-in-difference with matching methodology used by Persson and Tabellini 2007, is also useful in identifying primarily the long-run effect of democratization on growth.

The methodology I use in the chapter offers a variation on the regularly employed dynamic panel data estimators, such as dynamic fixed effects, and allows us to conveniently test for both short and long run effects in a single framework. This methodology, developed in a series of papers by Pesaran (1997), Pesaran, Shin and Smith (1999), Pesaran and Smith (1995), has been previously used to study the short and long run effects of financial development on growth (Loayza and Rancier (2005)).

In the following section I will discuss in more detail the modified Autoregressive Distributed Lag (ARDL) model of Pesaran (1997), and look at the various estimation approaches that may be undertaken within its framework.

3.3 ARDL Error-Correction Model and the Three Dynamic Panel Data Estimators

When researchers are interested in characterizing long-run relationship between time-series variables as well as the dynamic adjustment to the long-run equilibrium, the error correction modeling (ECM) is commonly a method of choice. Indeed, the main advantage of the ECM representation is that we can model both the long run and the short run relationships between the series without explicitly observing their long and short run components (Loayza and Rancier (2005)). Typically ECM is used when the time series in question are integrated (unit root) processes.

There has been some debate as to whether the ECM framework can be used in the context of stationary time series. Most studies, however, argue in favor of using ECM to estimate relationships between the stationary as well as integrated time series. In particular, Pesaran (1997) has argued that traditional methods, such as autoregressive distributed lag (ARDL) approach can be used for analyzing the long-run equilibrium relationship irrespective of whether the series are integrated or stationary.

The modified ARDL model, Pesaran argues, eliminates the need of pre-testing variables to identify unit root processes. On the other hand, this approach, unlike cointegration, takes as a given the existence of a long-run relationship between the series.

Following Pesaran, Shin and Smith (1999), I am starting with a standard ARDL(p,q) model:

$$y_{it} = \sum_{j=1}^{p} \lambda_{ij} y_{i,t-j} + \sum_{j=0}^{q} \delta_{ij} X_{i,t-j} + \mu_i + \varepsilon_{it} \qquad (2.5)$$

where $y_{i,t}$ is the growth of GDP per capita , and $X_{i,t}$ a kx1 vector of explanatory variables, such as investment, government expenditure and volume of trade as a share of GDP; inflation rate; infant mortality rate. Part of the $X_{i,t}$ vector is also the variable of interest, $Z_{ij,t}$, the change in the absolute political distance between country and its neighborhood. In addition, I introduce an interaction term $Z_{ij,t}$ *$Dem_{i,t,}$ where $Dem_{i,t}$ is the dummy which takes the value of 1 in the years after a positive enduring regime change has taken place[10].

The explanatory variables represented by the X_{it} vector vary both by country and across time; μ_i denotes the time-invariant country-specific effect.

The transformation of equation (2.5) into error-correction form[11] yields the following representation:

$$\Delta y_{it} = \sum_{j=1}^{p-1} \lambda^*_{ij} \Delta(y_{i,t-j}) + \sum_{j=0}^{q-1} \delta^*_{ij} \Delta(x_{i,t-j}) + \phi_i \left[y_{i,t-1} - \{\beta_{i0} + \beta_{i1} x_{i,t-1}\} \right] + \varepsilon_{it} \qquad (2.6)$$

where $\lambda^*_{i,j}$ and $\delta^*_{i,j}$ are the short-run coefficients defined by (2.5.1) and (2.5.2). (footnote 28).

The term in square brackets is the forcing long-run equilibrium condition, with φ_i representing the speed of adjustment to the equilibrium. In terms of equation (2.5) parameters, $\varphi_i = -(1 - \sum_{j=1}^{p} \lambda_{ij})$; $\beta_{i,0} = -\frac{\mu_i}{\varphi_i}$; $\beta_{i1} = \frac{-\left(\sum_{j=0}^{q} \delta_{ij}\right)}{\varphi_i}$.

The model's parameters are then estimated using maximum likelihood approach, assuming that the error term is normally distributed, although for the asymptotic result this assumption is not required.

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[10] Positive enduring regime change is defined as a 3-point increase in the country's Polity score in the course of 3 years, which lasted a minimum of 5 years. Democratization dummy takes the value of 0 in the years when the country either experiences negative enduring regime change or no change in its political status since the beginning of the sample

[11] The transformation is achieved by adding and subtracting the following two terms to equation (2.5):

(2.5.1) $y_{i,t-1} + \sum_{j=1}^{p-1} \lambda^*_{ij} y_{i,t-j}$; where $\lambda^*_{ij} = \sum_{m=j+1}^{p} \lambda_{im}$.

(2.5.2) $\sum_{j=0}^{q-1} \delta^*_{ij} x_{i,t-j}$; where $\delta^*_{ij} = \sum_{m=j+1}^{q} \delta_{im}$

Certain assumptions must also be made to ensure consistency of the estimated parameters.

First, that the error term ε_{it} is independently distributed across i and t, with mean zero and variance $\sigma_i>0$; ε_{it} must also be distributed independently of the X_{it} regressors. To ensure the independence of regression residuals across countries, one of the strategies is to express all variables in the regression in the form of deviations from their cross-sectional means for each year[12].

Pesaran and Smith (1995) show that the assumption of independence between X_{it} and ε_{it} can be relaxed if the model is sufficiently augmented with the lagged values of X_{it}. It is not practical, however, to introduce lags for all of the explanatory variables, as this will result in the loss of degrees of freedom. Therefore, following Loayza and Rancier, the ARDL model used in this chapter includes 3 lags of growth rate, 2 lags of the change in the absolute political distance variable $Z_{i,t}$ along with 2 lags of the interaction term between $Z_{i,t}$ and the Democratization dummy. The ARDL also includes 1 lag of each of the other explanatory variables in the model.

Given panel data where the number of cross sections N and the number of time periods T is sufficiently large, Pesaran et al. (1999) discuss three possible approaches to estimating the coefficients of equation (2.6). These approaches differ in their treatment of the long and short-run coefficients estimated by the model.

On one hand, we may estimate the model given by equation (2.6) for each country in the panel separately and then take the average of the resulting coefficients. This approach, the Mean Group (MG) estimator allows for consistent estimation of the average, and also for full heterogeneity of the model's parameters. However, if the parameters are common across countries, then MG estimator is still consistent but not efficient. Another drawback of the MG estimator is its sensitivity to the outliers, particular in small samples.

The second approach, the Pooled Mean Group (PMG) estimator developed by Pesaran, Shin and Smith (1998) allows for heterogeneity among the short run coefficients, but restricts

[12] See Loayza and Rancier (2005) for the empirical application of the Pesaran's model to estimate the effects of financial development and financial fragility on growth

long-run coefficients to be the same across countries[13]. The validity of this assumption can be tested using the Hausman specification test. If the assumption of homogeneity is not valid, the PMG estimates will be inconsistent.

Finally, the commonly used Dynamic Fixed Effects (DFE) estimator restricts all coefficients in the model to be homogeneous across countries.

In this chpter I will consider the results of all three approaches to estimate the political spillover effects between the neighboring countries.

Section IV. Data and Results

The overall panel used in this chapter consists of 61 countries and the annual data covering the period from 1820-2003. However, not all variables appearing in the regression have observations in all years. For the purpose of the ARDL estimation I will consider the sample in which each country has at least 20 years of data is available for all the variables appearing in the regression[14].

I also test that the ARDL model given by equation (2.5) is stable when applied to each country separately. I further exclude several countries (Hungary, Singapore, Indonesia) that have the roots of the lagged dependent variable outside the unit circle[15]. The estimation sample consists of 33 countries with an average of 70 years annual data.

Table 2.1 summarizes the results of the ARDL growth model as described by equation (2.5).

As noted before, in order to reduce the number of parameters in the model, and in the same time account for common period shocks, I express all continuous variables as deviations from the cross-section mean in each year.

4.1 Long- run effects

Consider first the PMG estimation of the long-run coefficients (Table 2.1 column 1). One may note that the long run coefficient on the Democratization dummy is significant

[13] As Loayza and Rancier point out, the PMG estimator (provided that the homogeneity assumption is valid) is less sensitive to the outliers, because it functions as a weighted average of the country-specific long-run coefficients. In the PMG model, long-run coefficients are weighted by the inverse of their variance-covariance matrix, with large variance coefficients being less prominent in the estimation of the total.

[14] Using more than 20 time observations is necessary to reduce a possible bias in the coefficients.

[15] This stability condition requires that $\varphi_i = -(1 - \sum_{j=1} \lambda_{ij})$ be less than 2 in the absolute value.

and positive. This implies that the country experiencing a positive enduring regime change increases its long-run annual growth rate of GDP per capita by 0.33%. This finding is consistent with the literature. In Papaioannou and Siourounis (2005), for example, the coefficient on Democratization ranges from 0.4% to 0.7%[16]. Persson and Tabellini (2007) estimate the effect of democratization to range from 0.6% to 1.08%.

Of particular interest is the coefficient on the interaction term between Democratization and the change in the absolute political distance, $Z_{it.}$ The interaction term coefficient can be interpreted as the relative change in the GDP per capita growth rate for countries that in the process of democratization move away from their political neighborhood. The long-run coefficient is significant and negative. This suggests that countries, which after having democratized move away from their neighbors on the political spectrum, on average experience a decline in the growth rate of GDP per capita of 0.318%.[17]

This finding supports the hypothesis initially put forward in the chapter: political spillover effects do influence the country's growth rate in the wake of democratization.

The negative interaction coefficient helps answer the question of why countries may have different experiences with democratization: the country surrounded by neighbors that become relatively close on the political spectrum, would have easier time not only in solidifying the positive regime change (Persson and Tabellini (2007)), but also would gain economic advantage in the form of higher GDP per capita growth rates. On the other hand, a movement away from the neighbors on the political spectrum may decrease the growth rate of GDP per capita.

Not surprisingly then, the overall effect of democratization (the sum of the coefficients on Democratization and the interaction term) is indistinguishable from zero. The result echoes the finding by Milanovic (2005).

An interesting finding of this chapter is that there also seem to be regional differences when it comes to assessing the impact of political spillovers. Table 2.2 and Table 2.3 present

[16] The smaller overall size of the coefficient is most likely due to the different definitions of democratization. In the P&S study democratization is defined as the Polity score above 0, while in this paper democratization is defined as a 3 point increase in the country's Polity index, irrespective of whether the index is positive or negative.

[17] Once again, one must note that the movement in $Z_{i,t}$ may be due either to the country's own political changes, or to the political processes in the neighboring countries. The interaction term thus captures the political spillover effect of own as well as external political changes.

the results of the PMG estimation run separately on two groups of countries – Latin America and Europe.

For Latin American countries the coefficients on democratization and the interaction term are both significant and positive. In the process of democratization, the one point movement away from the political neighborhood seems to increase growth rate of GDP per capita by 0.43%.

In the same time, the coefficient on $Z_{i,t}$, the absolute political distance change is significant and negative, – 0.34% for each point increase in the political distance. This coefficient captures the effect of movement away from the neighborhood for countries that have not undergone democratization. This movement may occur either because a country is experiencing a negative political regime change at home, or because other countries in the neighborhood are undergoing positive political transitions, while the country in question remains relatively more autocratic.

Results for Europe are quite different. Democratization coefficient is positive, but not significant; the coefficient on the interaction term is significant and negative (as in the overall sample), and the coefficient on $Z_{i,t}$ is significant and positive. These results suggest that a European country undergoing positive political regime change would face a decrease in the growth rate of GDP per capita by 0.48% for each point increase in the political distance with its neighborhood. In the same time, the coefficient for Z_{it} is positive, suggesting that countries, which move away from their neighborhood while not experiencing democratization, may actually benefit in terms of growth.

The long-run coefficients on the control variables, such as volume of trade, government expenditure and investment as a share of GDP, infant mortality rate – all have signs consistent with the theory. For example the increase in the volume of trade, investment, increases growth in the long run, while increase in the government expenditure, infant mortality, inflation rate affects growth negatively. The initial log GDP per capita level (lagged 5 periods) is negative, suggesting the speed of convergence of about 2.6%, a number consistent with most empirical growth studies.

The magnitudes of the coefficients are also consistent with the findings of the previous studies. (For example, the estimated coefficient on trade in Papaioannou and Siourounis (2005) ranges from 0.02% to 2.2%.

The finding of this chapter is that an increase in the volume of trade/GDP ratio by one point, increases growth by 1.4% in the long run.

4.2. Short-run effects

The short run coefficients of the PMG estimator represent the initial response of the growth rate to the shocks affecting the explanatory variables in the model. The coefficients signs suggest that an initial increase in the political distance between the country and its neighborhood while the country is undergoing democratization, may boost growth in the short term. This effect, however, is not significantly different from zero. The Mean Group (MG) coefficient on $\Delta Z_{i,t}$ is significant and positive. This implies that an increase in the absolute political distance, while the country is not democratizing (or while the country is possibly undergoing a negative regime change) may temporarily increase growth. This may be due to the greater "predictability" of politically restrictive regime, which in turn may have a positive short run effect on economic growth.

4.3 Comparing MG and PMG estimators

The Mean Group Estimator allows the coefficients to be different across countries. This method, as noted earlier, is consistent, but not efficient, if the underlying parameters are in fact homogeneous across countries. On the other hand, the Dynamic Fixed Effects estimator, another widely used method, restricts all slopes to be the same across countries, but allows for individual intercepts. The DFE is consistent and efficient only if the slope coefficients are indeed the same. If they are not, the DFE is biased. Pesaran and Smith (1995) have noted that the Pooled mean groups estimator offers a compromise between these two methods – allowing the short run coefficients between the countries vary, but restricting the long-run coefficients to be the same.

However, we still need to test for the validity of the restrictions placed on the long-rung coefficients. This may be done via Hausman specification test on each individual long-run coefficient as well as the vector of coefficients (the joint Hausman test).

The null hypothesis of the Hausman test is that there exists no systematic difference between the coefficients in the restricted and the unrestricted models. The failure to reject the null would lead the conclusion that coefficient restrictions are valid, and the restricted model is both consistent and efficient.

The p-values of the Hausman test are presented in Table 2.1. The joint coefficient test rejects the null hypothesis, yet the test on individual parameters suggests that using PMG estimator is still warranted in the context of this study. While the long-run coefficients on investment and infant mortality rate may not be the same across countries, the cross-country restrictions on the other coefficients are justified. Given that the main interest of this chapter is to assess the impact of Democratization and political distance changes on growth, the PMG estimator is preferred to MG in this context.

Section V. Conclusion

The results presented in this chapter offer one explanation as to why political changes, especially democratic regime changes may bring different economic outcomes to different countries. The chapter explores the cross-country political spillover effects, and seeks to answer the question of whether democratization is more difficult for countries surrounded by the relatively more autocratic neighbors - in part because of the political spillover impact on the economic growth.

The results point to a significant negative effect of the increase in the absolute distance between the country and its neighbors. Democratization affects economic growth positively in the long run but its influence may be counterbalanced by the country's movement away from its neighborhood on the political spectrum. The short-run coefficients on political variables do not seem to significantly affect economic growth.

However, in some specifications the countries that have not democratized seem to experience a temporary increase in the growth rate following the increase in the political distance with the neighborhood. As noted above, this result may be due to the greater "predictability" of politically restrictive regime in the times of change, which may impact short run growth.

There is some evidence, however, that the long-run effects of political variables may be region-specific. For Latin American countries in particular, democratization seems to be benefiting growth even when the absolute political distance between countries is increasing.

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Appendix

Data coverage

There are overall 61 countries in the dataset. The bold script denotes the countries with more than 20 years annual observations.

Western/Northern Europe: **United Kingdom, Ireland, Netherlands, Belgium, France, Switzerland, Spain, Portugal, Prussia, Germany, Austria, Italy, Finland, Sweden, Norway, Denmark.**

Eastern Europe/Central Asia: **Poland, Hungary,** Czechoslovakia, Czech Republic, Slovakia, Albania, Macedonia, Croatia**, Yugoslavia,** Serbia-Montenegro, Bosnia**,** Slovenia**, Greece,** Bulgaria**,** Moldova, Romania, USSR, Russia, Estonia, Latvia, Lithuania, Ukraine, Belarus, Armenia, Georgia, Azerbaijan, **Turkey**.

Asia/Oceania: **Japan, Thailand, Malaysia, Singapore, Philippines, Indonesia, Australia, New Zealand.**

The Americas: **United States, Canada, Mexico, Colombia, Venezuela, Peru, Brazil, Chile, Argentina, Uruguay.**

Positive Political Regime change episodes:

Positive Enduring Regime (PER) change (lasting over 5 years) - 60 episodes

PER change, movement "closer" to the regional polity mean – 35 episodes

PER change, movement "away" from the regional polity mean – 25 episodes

Table 1. Sample expansion overtime for PER change:

time period	# of episodes Closer	# of episodes Away
before 1900	5	9
1900-1924	8	3
1925-1949	6	5
1950-2000	16	8
Total	35	25

Table 2. Number of episodes by region for PER change:

Time period	# of episodes Closer	# of episodes Away
Western Europe	12	14
Eastern Europe	1	3
Western Offshoots	0	1
Latin America	19	5
Asia	3	2
Total	35	25

Table 3
Dynamic specification: ARDL(3,2,2,1,1,1,1,1); Estimators: Pooled Mean Group, Mean Group and Dynamic Fixed Effects.
Sample: All countries with more than 20 observations*

	PMG Estimator		*MG Estimator*		**Hausman test**	*DFE Estimator*	
Variables	Coefficient	P-value	Coefficient	P-value	P-value	Coefficient	P-value
Long-Run Equation Coefficients							
Z (Absolute political distance change)	0.00042	0.4730	-0.00157	0.2850	**0.1395**	-0.0014	0.055
Z*Democratization	**-0.00318**	0.0000	-0.00185	0.2420	**0.3039**	-0.0002	0.884
Democratization	**0.00326**	0.0470	0.0021	0.3250	**0.396**	0.0026	0.258
Volume of Trade	**0.0137**	0.0040	0.0273	0.2260	**0.538**	**0.0202**	0.004
Government Expenditure	**-0.035**	0.0000	**-0.1025**	0.0050	**0.054**	**-0.0591**	0.000
Investment	**0.0422**	0.0300	**0.1009**	0.0020	0.03	**0.0445**	0.076
Log Infant mortality	**-0.0178**	0.0000	**-0.0402**	0.0010	0.049	**-0.0252**	0.000
Inflation rate	**-0.0131**	0.0000	0.0027	0.7760	**0.076**	**-0.0093**	0.000
log GDP initial level	**-0.026**	0.0000	**-0.0414**	0.0000	**0.109**	**-0.0332**	0.000
Speed of Adjustment Coef.	**-0.9389**	0.0000	**-1.3367**	0.0000		**-0.8674**	0.000
Short-Run Coefficients			Joint Hausman test p-value:		0.000		
Δ Growth (t-1)	0.0267	0.3920	**0.2432**	0.0000		0.0146	0.575
Δ Growth (t-2)	-0.0304	0.1880	**0.0863**	0.0040		0.0192	0.328
Δ Z	-0.0027	0.6020	-0.0018	0.6730		-0.0010	0.529
Δ Z (t-1)	0.0074	0.1100	**0.0093**	0.0230		**0.0048**	0.006
Δ Z * Democ.	0.0012	0.2990	0.0017	0.3960		-0.0008	0.497
Δ Z (t-1)* Democ.	0.000004	0.9970	0.0011	0.4780		-0.0016	0.157
Δ Government Expenditure	-0.0229	0.7280	0.0324	0.6380		**0.0384**	0.094
Δ Volume of trade	0.0103	0.7730	-0.00168	0.9710		0.0278	0.131
Δ Infant mortal. (log)	-0.0199	0.3570	0.0257	0.1240		-0.0061	0.516
Δ Inflation	-0.004	0.4000	-0.0028	0.6610		**0.0024**	0.059
Δ Investment	**0.4686**	0.0000	**0.3714**	0.0000		**0.4035**	0.000
War years	0.0013	0.5090	0.0046	0.1060		**0.0092**	0.003
Crisis	**-0.0048**	0.0210	**-0.0058**	0.0100		**-0.0036**	0.041
Intercept	-0.0004	0.8370	-0.0104	0.4630		-0.0022	0.147
No of observations	2468		Number of countries:		33		

* Hungary, Singapore, Indonesia are also excluded from the sample due to the instability of adjustment coefficients in the individual country's ARDL equation

Table 4
Dynamic specification: ARDL(3,2,2,1,1,1,1,1); Estimators: PMG, MG and DFE
Sample: Latin America

	Pooled Mean Group Estimator		Mean Group Estimator		Dynamic Fixed Effects Estimator	
Variables	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Long-Run Equation Coefficients						
Z (Absolute political distance change)	**-0.0034**	0.0010	**-0.0040**	0.0000	**-0.0025**	0.0360
Z*Democratization	**0.0043**	0.0040	**0.0046**	0.0000	**0.0032**	0.0990
Democratization	**0.0107**	0.0070	**0.0086**	0.0330	**0.0096**	0.0380
Volume of Trade	0.0166	0.1830	0.0743	0.2710	0.0250	0.1080
Government Expenditure	-0.0336	0.1590	-0.0486	0.4630	**-0.0728**	0.0330
Investment	**0.1037**	0.0240	**0.2258**	0.0030	**0.1435**	0.0080
Log Infant mortality	**-0.0256**	0.0010	**-0.0582**	0.0200	**-0.0229**	0.0070
Inflation rate	**-0.0065**	0.0000	0.0037	0.7430	**-0.0080**	0.0000
log GDP initial level	**-0.0713**	0.0000	**-0.0671**	0.0000	**-0.0561**	0.0000
Speed of Adjustment Coef.	**-1.1691**	0.0000	**-1.4885**	0.0000	**-1.0755**	0.0000
Short-Run Coefficients						
Δ Growth (t-1)	**0.2689**	0.0010	**0.4190**	0.0030	**0.1430**	0.0240
Δ Growth (t-2)	**0.0999**	0.0140	**0.1819**	0.0430	0.0718	0.1130
Δ Z	-0.0017	0.5830	-0.0034	0.3300	-0.0017	0.5530
Δ Z (t-1)	**0.0064**	0.0270	**0.0088**	0.0040	0.0032	0.3330
Δ Z * Democratization	-0.0023	0.2980	-0.0026	0.2370	-0.0011	0.6230
Δ Z (t-1)* Democratization	-0.0033	0.2960	-0.0021	0.4940	-0.0025	0.2630
Δ Government Expenditure	0.0396	0.7340	0.0533	0.6580	-0.0189	0.6940
Δ Volume of trade	-0.1166	0.1600	-0.1475	0.1380	-0.0623	0.1170
Δ Infant mortality (log)	**-0.0759**	0.0490	-0.0321	0.2760	**-0.0583**	0.0160
Δ Inflation	-0.0010	0.8370	-0.0050	0.4240	**0.0030**	0.0550
Δ Investment	**0.4587**	0.0010	**0.3231**	0.0550	**0.5145**	0.0000
War years	0.0016	0.3170	0.0029	0.3170	0.0058	0.8220
Crisis	**-0.0152**	0.0000	**-0.0162**	0.0000	**-0.0103**	0.0490
Intercept	-0.0092	0.2560	0.0286	0.3420	-0.0063	0.2300
No of observations	482		482		482	
No. of countries	8		8		8	

Table 5
Dynamic specification: ARDL(3,2,2,1,1,1,1,1); Estimators: PMG, MG and DFE
Sample: Europe, US and Canada

	Pooled Mean Group Estimator		Mean Group Estimator		Dynamic Fixed Effects Estimator	
Variables	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Long-Run Equation Coefficients						
Z (Absolute political distance change)	**0.0013**	0.097	0.0194	0.344	-0.0006	0.547
Z*Democratization	**-0.0048**	0.000	**-0.1343**	0.009	-0.0019	0.195
Democratization	0.0021	0.247	0.0577	0.159	0.0003	0.921
Volume of Trade	0.0082	0.114	-0.0011	0.633	0.0140	0.117
Government Expenditure	**-0.0236**	0.025	**-0.0053**	0.026	**-0.0541**	0.001
Investment	0.0315	0.153	0.0008	0.809	-0.0103	0.746
Log Infant mortality	**-0.0093**	0.006	-0.0180	0.128	**-0.0171**	0.000
Inflation rate	**-0.0255**	0.004	0.0084	0.542	**-0.0271**	0.038
log GDP initial level	**-0.0149**	0.002	-0.0120	0.297	**-0.0205**	0.002
Speed of Adjustment Coef.	**-0.9677**	0.000	**-1.2169**	0.000	**-0.8466**	0.000
Short-Run Coefficients						
Δ Growth (t-1)	0.0207	0.636	**0.1482**	0.000	-0.0192	0.541
Δ Growth (t-2)	-0.0347	0.288	0.0201	0.386	-0.0036	0.879
Δ Z	-0.0045	0.585	-0.0030	0.658	-0.0006	0.792
Δ Z (t-1)	0.0072	0.234	**0.0112**	0.045	**0.0051**	0.029
Δ Z * Democratization	0.0019	0.284	0.0040	0.208	-0.0009	0.560
Δ Z (t-1)* Democratization	-0.0003	0.732	0.0022	0.324	-0.0013	0.408
Δ Government Expenditure	0.0214	0.797	0.0621	0.510	**0.0904**	0.001
Δ Volume of trade	0.0505	0.192	0.0395	0.363	**0.0835**	0.000
Δ Infant mortality (log)	0.0166	0.387	0.0285	0.172	0.0077	0.479
Δ Inflation	0.0032	0.665	-0.0026	0.804	-0.0019	0.826
Δ Investment	**0.3748**	0.000	**0.3427**	0.001	**0.2331**	0.000
War years	0.0017	0.420	0.0021	0.518	**0.0090**	0.007
Crisis	0.0003	0.910	0.0007	0.790	-0.0015	0.468
Intercept	0.0014	0.281	-0.0017	0.876	-0.0011	0.570
No of observations	1666		1666		1666	
No. of countries	19		19		19	

Table 6
Dynamic specification: ARDL(3,2,2,1,1,1,1,1); Estimators: PMG, MG and DFE
Sample: Asia and Oceania

	Pooled Mean Group Estimator		Mean Group Estimator		Dynamic Fixed Effects Estimator	
Variables	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Long-Run Equation Coefficients						
Z (Absolute political distance change)	**0.0020**	0.033	0.0002	0.957	0.0014	0.439
Z*Democratization	**-0.0045**	0.033	0.0005	0.669	0.0011	0.779
Democratization	-0.0003	0.954	-0.0023	0.120	0.0053	0.596
Volume of Trade	0.0172	0.193	-0.0107	0.858	**0.0391**	0.049
Government Expenditure	**-0.0645**	0.086	-0.0739	0.361	-0.0446	0.338
Investment	**0.0962**	0.058	0.0710	0.231	**0.1251**	0.027
Log Infant mortality	**-0.0346**	0.002	**-0.0867**	0.016	**-0.0385**	0.005
Inflation rate	**-0.0612**	0.000	-0.0169	0.482	**-0.0631**	0.006
log GDP initial level	**-0.0492**	0.000	**-0.1001**	0.000	**-0.0618**	0.000
Speed of Adjustment Coef.	**-1.1541**	0.000	**-1.5137**	0.000	**-0.9507**	0.000
Short-Run Coefficients						
Δ Growth (t-1)	**0.1274**	0.093	**0.3095**	0.000	0.0695	0.404
Δ Growth (t-2)	0.0233	0.748	**0.1685**	0.002	0.0850	0.174
Δ Z	0.0032	0.812	0.0042	0.643	-0.0023	0.656
Δ Z (t-1)	0.0103	0.612	0.0044	0.769	0.0001	0.984
Δ Z * Democratization	0.0001	0.941	-0.0001	0.892	-0.0036	0.336
Δ Z (t-1)* Democratization	0.0016	0.207	0.0018	0.270	0.0023	0.483
Δ Government Expenditure	-0.2084	0.284	-0.0896	0.633	-0.0446	0.652
Δ Volume of trade	0.0244	0.843	0.0625	0.716	-0.0027	0.959
Δ Infant mortality (log)	-0.0538	0.497	**0.0938**	0.013	-0.0042	0.869
Δ Inflation	0.0100	0.455	-0.0009	0.949	0.0221	0.129
Δ Investment	**0.5606**	0.000	**0.5266**	0.000	**0.5858**	0.000
War years	0.0066	0.603	0.0147	0.183	0.0053	0.451
Crisis	**-0.0065**	0.096	**-0.0122**	0.031	0.0017	0.724
Intercept	**-0.0226**	0.084	**-0.0901**	0.065	**-0.0194**	0.006
No of observations	282		282		282	
No. of countries	6		6		6	

Figures 1-8 Neighborhood Polity, Country Polity and the Absolute political distance change $Z_{i,t}$. The shaded areas represent the periods of democratization

Figure 1

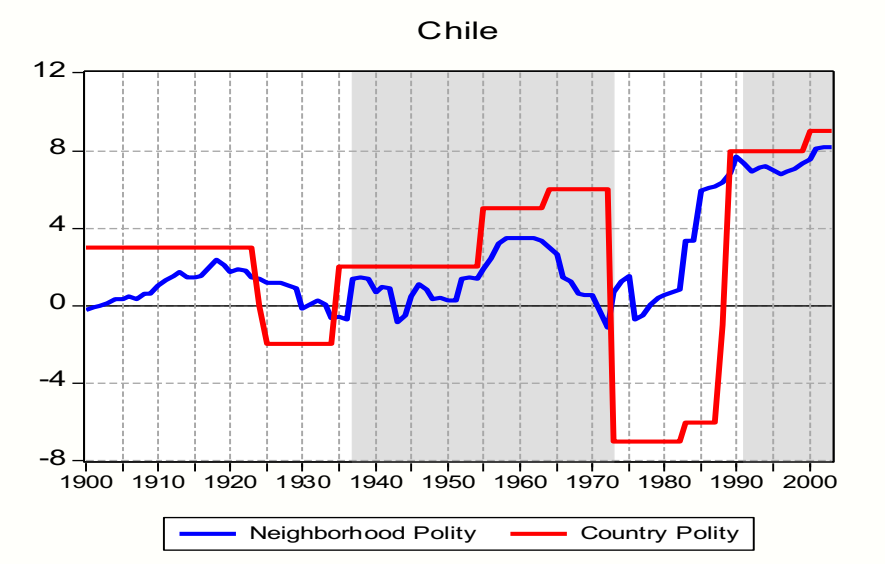

Figure 2

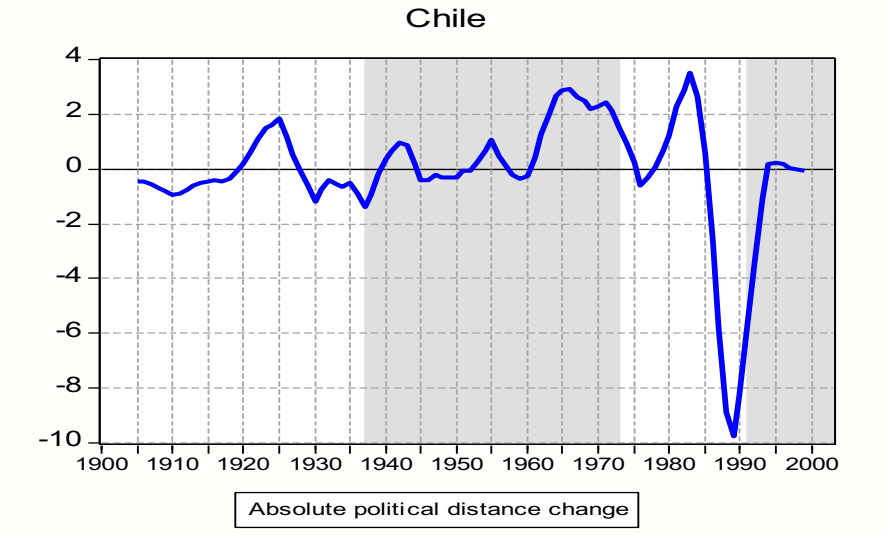

Figure 3

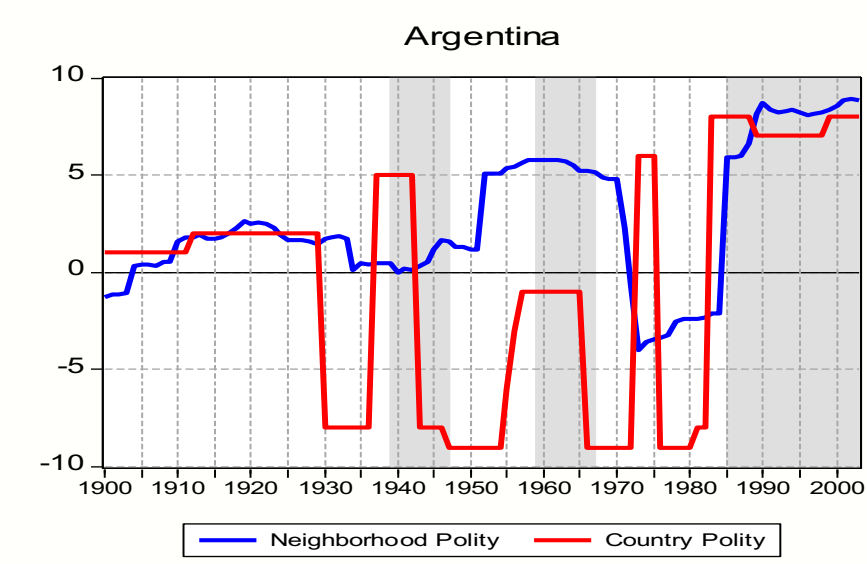

Figure 4

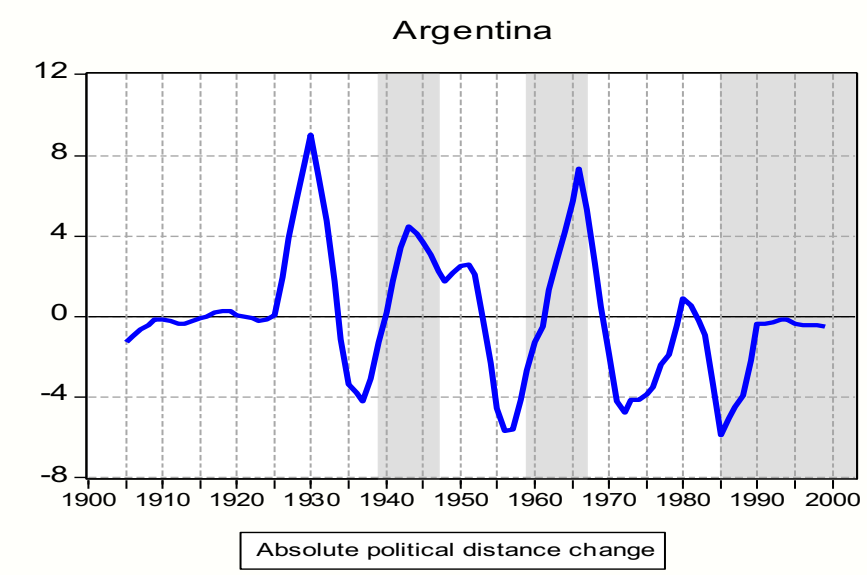

Figure 5

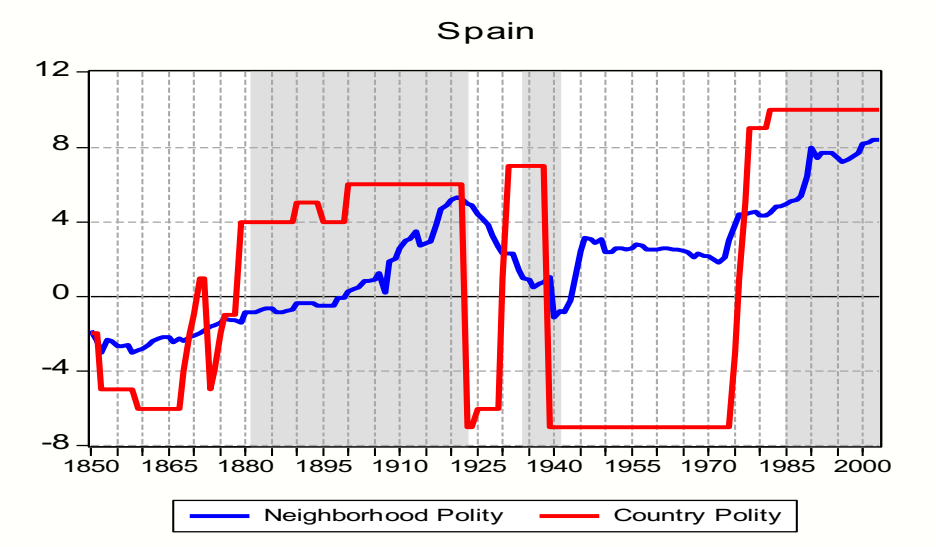

Figure 6

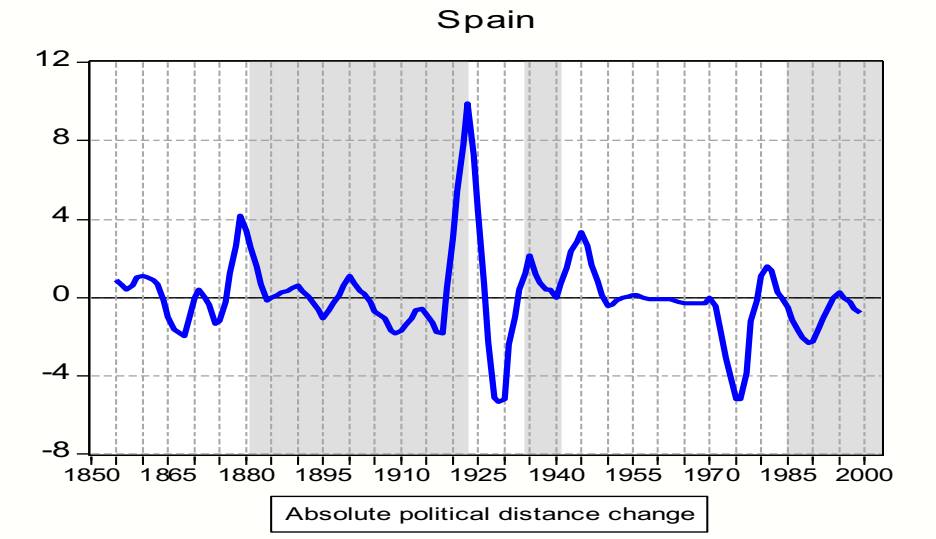

Figure 7

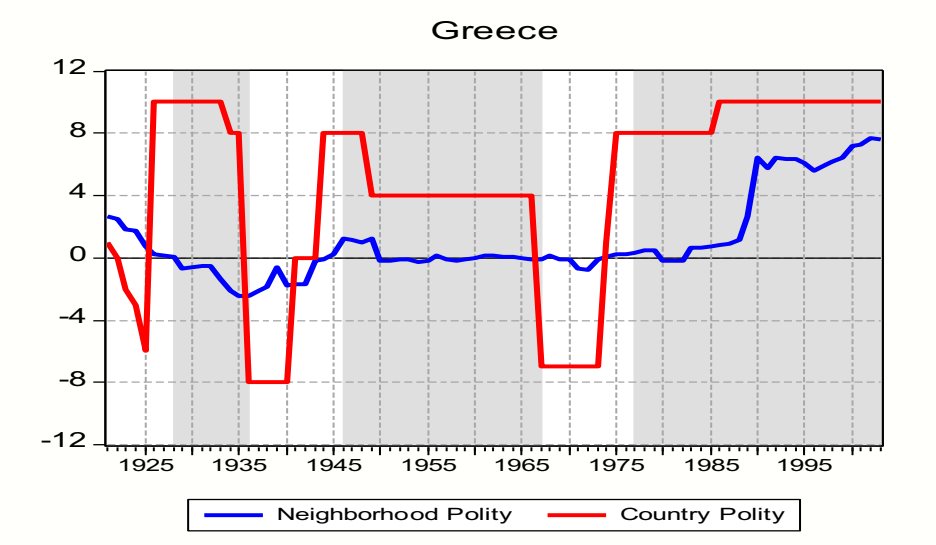

Figure 8