

THE POLITICAL REPLACEMENT EFFECT AND ECONOMIC GROWTH:
A PANEL DATA ANALYSIS

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The political replacement effect and economic growth: A panel data analysis

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Abstract

This paper tests for the existence of the political replacement effect, as suggested by Acemoglu and Robinson (2006). They argue that the implementation of market-oriented reform is crucially driven by the political calculus of incumbent governments: they implement economic policy change if such a choice is not expected to reduce their chances to retain power. This implies a non-monotonic relationship between the level of political competition and the extent of economic reform. We test this hypothesis using data for 102 countries over the period 1980 to 2005. Our results strongly support the theory.

Preliminary and Incomplete. Please do not quote

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1 Introduction

This paper tests for the existence of the so-called political replacement effect suggested by Acemoglu and Robinson (2006) (AR henceforth). These authors emphasise the importance of the political calculus of incumbent governments in the decision to implement market-oriented economic reforms. Unlike the mainstream literature that highlights the role of distributional conflicts in discouraging economic policy change, AR focus on the role played by incumbent governments whose political power is threatened by the implementation of institutional reforms critical to production. Extending one of their earlier papers (Acemoglu and Robinson, 2000), they propose a model in which incumbent governments might block economic reforms because they fear the possibility of losing their power, i.e., the political replacement effect. They argue that institutional change, although beneficial to society, might destabilise the existing political system and, in turn, erode the ability of incumbent governments to resist the political challenges of competing political groups.

The relationship between political and economic governance is controversial. While some scholars have argued that authoritarian regimes are likely to lead to market reforms, others have argued that democratic systems are needed to implement such reforms. The distributional conflict that characterises democratic systems tends to lead to failures and delays in the adoption of economic reforms (Fernandez and Rodrik, 1991; Rodrik, 1996). Similarly, Edwards (1991) notes that countries such as Chile, South Korea, and Taiwan introduced democracy only after undergoing economic reforms. Conversely, de Haan and Sturm (2003), Giavazzi and Tabellini (2005), and Amin and Djankov (2009a and 2009b) stress that democratic institutions strongly influence economic reforms.

AR offer a theoretical framework to unify these opposing views. They highlight the crucial role played by the political calculus of incumbent rulers in explaining the relationship between political and economic liberalisation. More specifically, AR claim that when political competition is low, the governments' incumbent advantage is high and, therefore, they do not fear replacement. In this context, the government's political power is sufficiently secure and market reforms are more likely, even though they might generate political turbulence. The opposite situation is characterised by a high degree of political competition. In this case, governments have little incumbent advantage and

prefer to carry out market-oriented reforms because, given their potential beneficial effects on the well-being of society, such reforms might increase the probability of their staying in power. When political competition is neither high nor low, incumbent governing elites are more likely to block economic change. In this case, they perceive that the politically destabilising effects associated with market-oriented reforms may significantly reduce their probability of retaining power. In AR's perspective, therefore, the political replacement effect determines a non-monotonic relationship between the extent of political competition and the level of economic reforms that may lead to the adoption of new technologies, more efficient factor markets and the protection of property rights.

AR use historical examples to support their theory. Specifically, they analyse cross-country differences in industrialization during the nineteenth century. They explain why Great Britain, Germany, and the United States enacted economic reforms that encouraged entrepreneurs to adopt new technologies leading to economic development, while Russia and Austria-Hungary blocked those reforms, causing economic stagnation. AR suggest that further empirical investigation is needed to test the validity of their theory. Our study conducts this type of empirical investigation and, to the best of our knowledge, it is the first such attempt in the literature.

We test the existence of the political replacement effect in a large sample of countries. Our empirical analysis strongly supports the existence of such an effect. We check our results for robustness in a number of directions. We use several estimation frameworks, ranging from the simple pooled ordinary least squares (OLS) estimator to alternative Generalised Method of Moments (GMM) approaches. We also test for non-monotonicity in the relationship between political competition and economic reform by comparing the empirical effectiveness of first, second, and third degree polynomials, by applying a new test for U-shaped relationships proposed by Lind and Mehlum (2010) and, finally, by using a piecewise linear regression.

Two important points need to be mentioned. First, it is difficult to envisage an appropriate and clean instrumental variable approach to instrument political institutions. Therefore, we employ a GMM framework, which generates instruments internally, and compare the results obtained with simpler econometric methods, such as OLS and Within Groups (WG). Second, while we take the direction of causality from political to economic institutions for granted, we are aware that the political and economic re-

form processes are likely to be jointly determined (Rodrik et al., 2004). In this regard, it is important to stress that none of the methodologies used in our empirical investigation establishes causality. Therefore, our results should be regarded as conditional correlations. Nonetheless, such correlations are interesting because they are statistically robust and largely consistent with AR’s theory. Thus, our findings suggest that theories analysing the relationship between political and economic institutions should be consistent with such correlations. In other words, our results help rule out theories that fail to produce these correlations (Mankiw, 1995). Nonetheless we do also provide a Granger test on the direction of causality between political competition and economic reforms. Consistent with AR, our evidence suggests that causality runs from the former to the latter.

The paper is structured as follows. In Section 2, we present the data used in the analysis and describe the methodological strategy. In Section 3, we comment on the results and present some robustness checks to corroborate our findings. Finally, in Section 4, we make some concluding remarks.

2 Data and Methodology

2.1 The Data

As argued above, the existence of the political replacement effect is based on the non-monotonic relationship between the extent of the political advantage of incumbent governments and the implementation of institutional reforms critical to production. Therefore, before moving to the empirical analysis, we need to identify the appropriate variables to measure the level of the incumbent’s political advantage, as well as the extent of institutional reforms.

As far as the level of the political advantage of incumbents is concerned, AR mention the degree of political competition as a proxy for the costs that other political groups must confront to replace a government in power. Moreover, when AR refer to institutional reforms critical to production, they specifically mean “the enforcement of property rights such as the creation of new legal institutions or the removal of regulations that prevent productive activities” (AR, 2006; p.117). Therefore, it is reasonable to argue that by institutional reforms critical to production, they refer to economic

liberalisation.

The empirical assessment of the relationship between the level of political competition (i.e., the extent of incumbent advantage) and the degree of economic liberalisation (i.e., the extent of institutional reforms critical to production) requires two suitable variables be selected. Several papers have examined the relationship between political competition and economic liberalisation, and rich panel datasets have been compiled (Wacziarg and Welch, 2008; Gwartney and Lawson, 2009; Marshall and Jaggers, 2009; Miller and Holmes, 2009).

De Haan et al. (2006) compare the different measures of economic liberalisation found in the literature. They note that the economic freedom index periodically compiled by the Fraser Institute has been extensively applied in empirical analyses and seems relatively effective at capturing the essence of market-oriented institutions. The Fraser index of economic freedom is an indicator that ranks 141 countries in terms of their degree of economic freedom, as measured by a composite of 42 indicators grouped into five major categories: size of government, legal structure, monetary and banking policy, international trade, and regulation. The index is a continuous variable, which ranges between 1 and 10, indicating low and high endowments of economic freedom, respectively (Gwartney and Lawson, 2009).

The primary independent variable is the extent of political competition. In line with other studies (e.g., Giavazzi and Tabellini, 2005; Huang, 2009), we use the Polity IV dataset to measure political competition (Marshall and Jaggers, 2009). More specifically, we employ a composite index focussing on two aspects that are crucial to capture the extent of political competition in a given country. The first refers to the competitiveness of participation. It is based on the extent to which alternative preferences for policy and leadership can be pursued in the political arena. The second component of the index provides information about the existence of binding rules on when, whether, and how political preferences may be expressed. The resulting index ranges between 1 and 10, with low and high values indicating low and high levels of political competition, respectively.

The set of control variables are largely based on those in AR. They present comparative static results that describe the effect of three different factors that influence the decision-making of incumbent governments when they have to choose whether to oppose or support market-oriented economic reforms. First, political incumbents are

more likely to block economic reforms when political rents are high. This is because the loss in terms of both income and power is larger if they are replaced. In line with the political economy literature (Mauro, 1995; Boerner and Hainz, 2009), we proxy the level of political rents using the index of corruption in the political system compiled annually by the Political Risk Services (PRS) Group (2009). The level of corruption is measured on an ascending 7-point scale with 0 and 6 indicating low and high levels of corruption, respectively.

Human capital is the second factor affecting the level of economic liberalisation. According to AR, higher levels of human capital increase the gains from economic reforms and make them more likely as well. We use the literacy rate of the adult population to measure the level of human capital. To obtain such a measure, we have updated the Barro and Lee (2001) human capital dataset using their primary source (the UNESCO database).

AR also argue that external threats from foreign countries make governing incumbents more pro-reform, because a higher level of development would allow them to manage and face those threats more effectively. To measure the effect of external threats on economic reforms, we use an index drawn from the PRS Group (2009) database. The index ranges between 0 and 12 where the higher the value, the higher the risk that the country is involved in episodes of international violence.

Finally, we include per capita GDP, measured using a chain index, along with its growth rate as controls to check the robustness of our results. Both variables are drawn from the Penn World Table 6.3 (Heston et al., 2009).

A final remark is needed to complete our presentation of data. The economic freedom index, which proxies the extent of market reforms is compiled for 1980, 1985, 1990, 1995, and 2000-2005. However, since we are interested in estimating a dynamic model, we cannot use the information in this form, because the autoregressive coefficient is not time invariant when data are not evenly spaced. Therefore, we construct a balanced panel that consists of 102 countries and 6 time observations. The resulting dataset is an evenly spanned balanced panel of 612 observations collected over 1980, 1985, 1990, 1995, 2000, and 2005.

Table 1 provides a description of the variables along with their respective sources. Table 2 provides the descriptive statistics while Table 3 gives the correlation matrix. All of the regressors appear to be strongly correlated with the level of economic freedom.

We note also that the signs of the correlations appear to be largely consistent with the theoretical predictions proposed by AR.

- Insert Table 1 -

- Insert Table 2 -

- Insert Table 3 -

2.2 The Empirical Strategy

Drawing on AR's theory, we assume that the desired level of economic reform in country i at time t , ER_{it}^* , depends on a polynomial of degree j of the level of political competition, PC_{it}^j , and on a set of s control variables, X_{sit} :

$$ER_{it}^* = \sum_{j=1}^J \beta_j PC_{it}^j + \sum_{s=1}^S \theta_s X_{sit} \quad (1)$$

where β_j and θ_s are parameters. The estimation of equation (1), however, presents some difficulties.

The first drawback is related to the nature of the variable on the left-hand side of the equation. The level of economic reform is the outcome of a process that implies changes in the institutional structure of the economy that are generally associated with a certain degree of inertia. This suggests the use of a partial adjustment model where the change in the level of economic liberalisation takes place gradually. Therefore, it can be considered as a fraction of its desired level:

$$(ER_{it} - ER_{it-1}) = \lambda(ER_{it}^* - ER_{it-1}) \quad (2)$$

where $0 < \lambda \leq 1$ captures the delay in the adjustment process. Solving equation (2) with respect to ER_{it} yields:

$$ER_{it} = (1 - \lambda)ER_{it-1} + \lambda ER_{it}^* \quad (3)$$

Combining equation (1) with equation (3) and adding country-specific effects, η_i , time dummies, η_t , and an i.i.d. error term, ε_{it} , yields:

$$ER_{it} = \gamma ER_{it-1} + \sum_{j=1}^J \mu_j PC_{it}^j + \sum_{s=1}^S \delta_s X_{sit} + \eta_i + \eta_t + \varepsilon_{it} \quad (4)$$

where $\gamma = (1 - \lambda)$, $\mu_j = \lambda\beta_j$, and $\delta_s = \lambda\theta_s$.

In equation (4), the presence of the lagged dependent variable, ER_{it-1} , captures the adjustment process of the dependent variable to the desired level. However, because of the presence of unobservable country-specific effects in the model, the OLS estimator leads to inconsistent parameter estimates. This is because ER_{it-1} and η_i are necessarily correlated even if the idiosyncratic component of the error term is serially uncorrelated. Removing the country-specific fixed effects by taking first differences does not resolve the problem because the first difference transformation introduces a correlation between the lagged dependent variable and the differenced errors. In our case, the WG estimator does not help because it is known to give seriously downward biased estimates for γ . Although the severity of the bias diminishes with the number of time periods, it may be serious for small T (Nickell, 1981).

Three other concerns arise with respect to the set of regressors we use. First, it is highly unlikely that the variables PC_{it} and X_{sit} can be treated as exogenous. Even if recent evidence suggests that political liberalisation determines economic reforms rather than the reverse (Feng, 2003; Dowson, 2003), there is still possible feedback from economic to political reforms (Giavazzi and Tabellini, 2005). Second, shocks that influence government choices regarding liberalisation policies are also likely to impact political competition (Acemoglu and Robinson, 2000). Finally, all of the variables are likely to be measured with errors and in our case this is particularly relevant since it has been shown that classical measurement error is likely to flatten the curvature of the estimated function (Kuha and Temple, 2003).

The discussion above calls for the use of an Instrumental Variables (IV) approach. Therefore, we opt to use the DIF-GMM estimator in the first instance (Arellano and Bond, 1991). This procedure removes the time invariant component of equation (4) by taking first differences and exploits the dynamic properties of the data to generate instrumental variables. We should note that, despite being widely used, the DIF-GMM has been shown to behave poorly in cases where time series are persistent. This is essentially due to lagged levels of the series providing weak instruments for subsequent first-differences (for an econometric discussion and an example of this issue in the context of growth regressions, see Bond et al., 2001). To investigate whether this is the case, we compare our results from DIF-GMM with those obtained from both the pooled OLS estimator and the WG estimator. In the presence of individual-specific effects,

the pooled OLS estimator produces an upward biased coefficient of the autoregressive parameter (Hsiao, 1986) while the WG estimator is expected to produce an estimate of the parameter that is downward biased in short panels (Nickell, 1981). As suggested by Nerlove (1999) and Bond et al. (2001), it is, therefore, likely that a consistent estimate of the autoregressive parameter will lie within these bounds.

The problems outlined above suggest a comparison with results coming from the SYS-GMM estimator, which has been shown to have superior finite sample properties (Arellano and Bover, 1995; Blundell and Bond, 1998). This methodology augments the Arellano and Bond (1991) framework by making the additional assumption that the first differences of instrumenting variables are uncorrelated with the fixed effects. More internal instruments are generated under this assumption. However, this choice is not free of criticism. Roodman (2009) suggests that in both the case of DIF-GMM and especially in the case of SYS-GMM, instrument proliferation is suspect. This suspicion arises because a large number of instruments may overfit instrumented variables, failing to expunge their endogenous component and biasing coefficient estimates towards non-instrumented ones. In addition, because we are studying instances of political and economic reforms, the initial conditions of the indexes may not be representative of their steady state distributions. If this is the case, the mean stationarity condition required by the SYS-GMM estimator may fail to hold.

If anything, the discussion above suggests that in our case, particular care must be given to the choice of the set of instruments in both the DIF-GMM and SYS-GMM frameworks. We opt for a parsimonious approach concerning the sets of instruments and provide a number of statistics that will help us decide our preferred specification. We test the assumption of the absence of higher-order serial correlation and conduct a test for second-order serial correlation. We also report the statistics for the Hansen test of over-identifying restrictions and test the additional moment conditions using the Hansen in difference test (Yasar et al., 2006). In an effort to study the impact of alternative sets of instruments on estimated parameters, we compare the results from DIF-GMM and SYS-GMM to those from simpler econometric methods.

Finally, being aware of the problems associated with the efficiency of the GMM procedures, we also use the LSDV bias corrected approach suggested by Kiviet (1995) that derives an approximation of the bias of the LSDV estimator in panel models where the set of regressors contains the lagged dependent variable. Kiviet (1995) constructs a

bias-corrected LSDV estimator, which has been shown to compare favorably with other consistent ($N \rightarrow \infty$, fixed T) estimators (Kiviet, 1995; Bruno 2005). The superiority of this method is discussed by Judson and Owen (1999) for panels of data whose dimensions are similar to ours.

3 Empirical Results

3.1 Main Results

Tables 4A and 4B report the empirical results concerning the shape of the relationship between the level of political competition and the extent of market-oriented economic reforms implied by the political replacement effect. We first report results from estimating a reduced form of equation (4), where the vector of the control variables has been removed. All of the models include time dummies. In our panel estimates, the standard errors are clustered by country. For each of the estimators, we assume monotonicity in the relationship between political competition and economic freedom and then check for either a quadratic or a cubic relationship.

In Table 4A, columns (a) to (c) report results from a pooled OLS approach. The results in columns (d) to (f) and (g) to (i) are obtained using WG and Kiviet’s bias-corrected WG (Kiviet, 1995), respectively. As pointed out above, in the presence of country-specific effects, pooled OLS gives an estimate of the autoregressive parameter that is biased upward while the WG estimator often gives a seriously downward-biased estimate of the parameter. We can use these estimates as approximate bounds to evaluate the consistency of the results estimated by GMM.

In Table 4B, the models in columns (a) to (c) are estimated using the DIF-GMM estimator. The choice of instruments is not an easy one. Arellano and Bond (1991) suggest using all available lags as instruments. However, recent research suggests that large sets of lags may lead to severe bias, especially when time series are persistent. Moreover, it has been shown that in such a case, the invalidity of the set of instruments would not be picked up by Hansen type tests (Bowsher, 2002; Roodman, 2009). Therefore, we choose lags $t - 2$ and $t - 3$ of all the variables as instruments, and assume that the differenced error is uncorrelated with such lags. As a robustness check, we use all the lags from $t - 2$ and earlier. The results, although available upon request, are not

presented because they are similar to those reported below. Finally, we re-estimate the same specifications using the SYS-GMM estimator (Arellano and Bover, 1995; Blundell and Bond, 1998). The results are reported in columns (d) to (f) in the same table.

- Insert Table 4 -

The autoregressive coefficient is statistically significant across all models in Tables 4A and 4B. This result supports the hypothesis that the adjustment process of the level of reform to its desired level is characterised by a certain degree of inertia. As expected, the value of the autoregressive parameter estimated by the GMM is lower than that obtained via pooled OLS and comfortably higher than that from WG. This is also true for coefficients estimated by both DIF-GMM and SYS-GMM. Although the Hansen and the autocorrelation tests do not detect serious problems with the validity of the instruments, when the model is estimated via DIF-GMM, some of the diagnostic test p -values are in the range of 10%-20%. These results are slightly worrisome for diagnostic tests. Further, the Hansen in difference test does not reject the validity of the additional moment conditions used by SYS-GMM. Overall, the estimates obtained via SYS-GMM are our preferred results.

In line with Giavazzi and Tabellini (2005), the evidence suggests a positive and statistically significant effect of political competition on market-oriented reforms. However, our work suggests there is a significant non-monotonicity. A model with a quadratic term performs better than a model that is linear in political competition. We note that the estimated minimum lies within the data range across all model specifications. The results from our analysis provide preliminary support for a non-monotonic relationship between political competition and economic liberalisation. The quadratic functional form is further confirmed by evidence from the estimation of a high-order polynomial where the null hypothesis of the non-existence of a cubic relationship is not rejected. It is important to note that the results from DIF-GMM and SYS-GMM are not substantially different in terms of the signs and statistical significance of coefficients.

In Tables 5A and 5B, we re-estimate all previous models including the set of control variables suggested in AR. The results suggest that the higher the level of political rents, the lower the extent of economic reform. This implies that greater political rents for incumbent governments reduce the gain from implementing market-oriented reforms.

Consistent with AR’s theory, the existence of severe external threats is a convincing reason for incumbent governments to introduce market liberalisation policies designed to promote growth that may improve the country’s military capabilities. However, we do not find evidence to support the hypothesis that human capital affects market-oriented reform, even though the coefficient shows the expected sign. More importantly, the findings in Tables 5A and 5B suggest that our preliminary results on the relationship between political competition and economic reforms are robust to the inclusion of the set of control variables. Interestingly, when the set of control variables is added to the set of regressors, the autoregressive coefficient estimated via the DIF-GMM drops; even if it is larger than that estimated via WG, such a difference is not really appreciable. Since the coefficient obtained via WG is likely to be biased and the Hansen in difference test does not reject the validity of the additional moment conditions, results from the SYS-GMM procedure are preferred.

- Insert Table 5 -

3.2 Robustness Checks

We check our results for robustness in several ways. A first concern is the existence of a minimum point in the relationship between political competition and market-oriented economic reform. Following a methodology shared by empirical research on the estimation of a non-monotonic relationship between variables, in Tables 4A and 4B and 5A and 5B we reported the estimates of a higher-order polynomial equation and compared them with a linear specification. The results showed that the quadratic model seems to perform well. This, together with the minimum point’s position within the range of the independent variable, offers further support for the U-shaped relationship between political competition and market-oriented economic reform (Mudambi, 1997).

However, Lind and Mehlum (2010) suggest that the criteria mentioned above are weak. They point out that if the true relationship is convex but monotone, the quadratic approximation may erroneously yield an extreme point. Thus, to test a U-shaped relationship, we need to examine whether the relationship is decreasing at low values and increasing at high values within the data range. Therefore, we check whether the relationship between political competition and economic reform is monotonic within

the data range and whether its first derivative is negative when evaluated at the minimum and positive when evaluated at the maximum of the index of political competition. Following Lind and Mehlum (2010), the appropriate null hypothesis is:

$$H_0 : \mu_1 + 2\mu_2 PC_{min} \geq 0 \text{ and/or } \mu_1 + 2\mu_2 PC_{max} \leq 0$$

against the alternative:

$$H_1 : \mu_1 + 2\mu_2 PC_{min} < 0 \text{ and } \mu_1 + 2\mu_2 PC_{max} > 0$$

where PC_{min} and PC_{max} are the minimum and the maximum levels of the index of political competition. Rejection of the null hypothesis would support the existence of a U-shaped relationship between political competition and market-oriented reforms.

The importance of this concern leads us to test the null hypothesis above for all of the models. Panel A of Table 6 gives the test statistics for the basic specifications shown in Tables 4A and 4B, while Panel B gives the results for the augmented specifications shown in Tables 5A and 5B. For each model, we report the slope estimated at the minimum and maximum of the data range, the associated t -statistics, as well as the test for the overall significance of a U-shaped relationship. For all of the models, we also report the estimated extremum point together with the associated confidence interval estimated by the Fieller method, which in the context of quadratic regression is preferable to the delta method (Kuha and Temple, 2003).

- Insert Table 6 -

Results suggest that the null hypothesis is comfortably rejected for all of the models. Consequently, the evidence supports non-monotonicity in the relationship between political competition and market-oriented reforms, which is consistent with our previous findings and with the extremum point occurring at about 4.5 in the political competition range. A similar result occurs when we check for a non-monotonic relationship between political competition and market-oriented reforms in the augmented model: with the pooled estimation as the only exception, all of the evidence favors a non-monotonic relationship. In such a case, the extremum point occurs at about 5 in the index of political competition.

The second robustness check examines whether our previous results are affected by an omitted variable bias. Islam (1996) suggests that GDP per capita and its growth rate significantly affect the level of market-oriented reform. Therefore, we include those two variables in the set of regressors to assess whether the U-shaped relationship between political competition and market-oriented reform is again confirmed. The results are reported in Table 7.

- Insert Table 7 -

The model specifications in columns (a) and (b) in Table 7 are estimated via Kiviet's bias-corrected WG. Column (a) includes the GDP growth rate, while column (b) includes the (log of) GDP per capita.

Note that political rents and external threats affect the implementation of market-oriented reforms, while human capital does not seem to have any statistically significant effect. These findings are consistent with those obtained earlier. Also note that, in line with Islam (1996), the GDP growth rate has a positive impact on the decision to implement market reforms. However, the impact is not statistically significant for the (log of) per capita GDP.

The findings in Table 7 are robust to the use of the DIF-GMM estimator (see columns (c) and (d)). It is important to note that both the Hansen and the second-order autocorrelation statistics support our choice of instruments. In columns (e) and (f), we carry out the same analysis using the SYS-GMM estimator. The results are in line with those in columns (a) to (d). However, similar to the results in Table 5B, the autoregressive coefficient in the SYS-GMM estimates is higher than that obtained using the DIF-GMM. Nonetheless, when we use the SYS-GMM, the p-values of the Hansen test are larger than those obtained using the DIF-GMM, which in the same case are in the slightly worrisome 10%-20% range. Moreover, when the DIF-GMM estimator is employed, the test for the absence of the second-order autocorrelation either rejects the null hypothesis or comes close to doing so. Finally, we note that the validity of the additional moment conditions is not rejected by the Hansen in difference test. As argued earlier, all these arguments suggest that the results obtained via SYS-GMM should be regarded as reliable and informative. However, and more importantly, the

estimation confirms a non-monotonic relationship between political competition and market-oriented reform.

Our final robustness check employs a linear piecewise regression approach to shed further light on the nature of the non-monotonic relationship between political competition and economic liberalisation. Following Morck et al. (1988) and Cho (1998), we derive two new variables from the level of political competition, PC , which are likely to have a non-monotonic effect on economic reform. We denote by ϕ the value of political competition at which the break is expected to occur and, on the basis of ϕ , we define the two new variables. The first is indicated by T_1 , which equates to the level of political competition if it is not greater than ϕ and a value equal to ϕ for any other higher level of political competition. The second variable is T_2 and takes the value of 0 if the level of political competition is not greater than ϕ and the value equals to $(PC - \phi)$ for all other levels. To be confident of selecting the correct value, we carry out several regressions using different values of ϕ . Moreover, we also check for the existence of more than one break in the relationship between PC and ER . The evidence suggests that there is only one break and it occurs at $\phi = 5$ (estimation results are available from the authors upon request). The choice of $\phi = 5$ is also consistent with the results in Table 6.

Using the new variables, T_1 and T_2 , constructed on the basis of $\phi = 5$, we run a new set of regressions employing Kiviet's bias-corrected WG, DIF-GMM, and SYS-GMM. The results are reported in Table 8. The U-shaped relationship between political competition and market-oriented economic reform is supported once more. Such a non-monotonic functional form appears to be robust to the inclusion of the control variables as well. The signs and statistical significance of the estimated coefficients are in line with our previous findings.

- Insert Table 8 -

3.3 Inertia and Causality

The analysis thus far assumes that the adjustment process of the level of economic reform to its long-run position is subject to inertia (North, 1990). There are reasons to

hypothesise that the explanatory variables have delayed effects on the extent of liberalisation. To test this hypothesis, we added the lagged values of human capital, political rents, and external threat to our set of regressors. Table 9 shows regression results employing Kiviet's bias-corrected WG, DIF-GMM, and SYS-GMM. They confirm the findings in Tables 5A and 5B.

- Insert Table 9 -

The only exception is human capital, which now appears to be positive and significant. The lagged impact of human capital on economic reform is negative but significant.

For political rents, the higher their current level, the less likely the economic reform. The past levels of political rents discourage the implementation of market-oriented reforms to a greater extent than current levels. Current external threats lead the incumbent government to introduce policies supporting market reforms. The effect of the lagged external threats on market-oriented reform does not appear to be statistically significant. Finally, while the current level of political competition significantly affects the decision to implement market reform as suggested by AR's theory, the coefficients of the lagged values of both the linear and quadratic levels of political competition are not significant.

The insignificant effect of the lagged values of political competition may be consistent with two different hypotheses. First, the lagged values of political competition have no effect on economic liberalisation. However, this interpretation would cast doubt on the explanatory power of political competition for the government's decision to implement market reforms. Second, the effect of political competition on economic reform is not homogeneous across the countries in our sample.

We implement a formal Granger-causality procedure in Table 10 to examine the two hypotheses. The procedure allows us to evaluate the direction of causality between political competition and market-oriented economic reform. The results are displayed in Table 10.

- Insert Table 10 -

Following the methodology suggested by Hurlin and Venet (2001), we first check whether the direction of causality goes from political competition to economic reform (column a in Table 10). Second, we test whether such an effect is homogeneous for each country (column b). Stated differently, the null hypothesis of the first analysis is the existence of a homogeneous non-causal relationship between the variables. Rejection of this hypothesis implies that political competition Granger-causes economic reform. The null hypothesis of the second analysis is that heterogeneous causality does not exist. The test is performed by interacting country dummies with political competition and then testing for the joint significance of such variables. Rejection of this hypothesis implies that the impact of political competition on the economic reform process is not homogeneous across countries. This allows us to provide the correct interpretation for the lack of significance of the lagged coefficients for PC and PC^2 in Table 9.

Results in column (a) suggest that the effect of the set of control variables on market-oriented reforms is consistent with our previous analysis. The signs and significance of the coefficients mirror those in Table 5B. The χ^2 -statistic for the joint significance of the variables PC_{it-1} and PC_{it-1}^2 rejects the null hypothesis of homogeneous non-causality between political competition and market-oriented reform, suggesting that the direction of causality between the variables runs from the former to the latter. Column (b) confirms this hypothesis. The result of the χ^2 -statistic for the joint significance of the interaction dummies indicates that the effect of political competition on economic reform is not homogeneous across the sample.

4 Conclusions

There has been growing interest in the political determinants of economic policy. Several studies, both theoretically- and empirically-oriented, have investigated the effect of different political systems on public decision making (Drazen, 2001, Persson and Tabellini, 2000, and Persson and Tabellini, 2003, for surveys of the literature). Within this literature, AR (2006) propose a theory explaining why Great Britain, Germany, and the United States industrialised during the nineteenth century, while Russia and Austria-Hungary blocked development. They argue that the countries that underwent a path of lasting development have been critically affected by the creation of market-oriented economic institutions. However, the decision to initiate economic reforms is

highly influenced by the political calculus of incumbent governments whose power is threatened by the implementation of such reforms. In this paper, we empirically test AR's theory in a large sample of countries with more recent data. More specifically, we focus on 102 countries during the time period from 1980 to 2005.

Our findings largely confirm the theoretical hypotheses stemming from AR's contribution. First, in line with AR's study, we find that the implementation of economic reform is affected by the degree of political competition. Second, our results support the existence of the political replacement effect: incumbent governments are more likely to initiate economic reforms in countries where political competition is either high or low. In countries whose political system is characterised by intermediate levels of political competition, incumbent governments are likely to block economic reforms. Third, the existence of rents accruing to incumbent governments is a barrier to the implementation of market-oriented reforms: the higher these rents, the lower the degree of economic reform. Fourth, external threats affect the decision to implement market reform: the higher the external threat, the more likely the incumbent government is to initiate economic reform. Finally, even if the results are not as robust as we would like, the extent of economic reform is also influenced by human capital.

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TABLE 1*Description and Source of variables and List of Countries*

Variables	Description	Source
Economic Freedom	Degree of economic freedom	Gwartney and Lawson (2009)
Political Competition	Level of political competition ranging from 1 (low competition) and 10 (high competition)	Marshall and Jaggers (2009)
Rent	Degree of corruption in the political system ranging from 0 (no corruption) to 6 (high corruption)	Political Service Risk Group (2009)
Human Capital	Literacy rate of adult population (15+)	Barro and Lee (2001) and Unesco (2008)
Threat	Degree of external threat indicating the risk of being attacked by a foreign country. It ranges between 0 (no risk) to 12 (high risk)	Political Service Risk Group (2009)
GDP Growth	Growth rate of per capita GDP	Heston, Summers and Aten (2009)
(log of) GDP per Capita	Per capita real GDP	Heston, Summers and Aten (2009)

Notes: The countries included in the analysis are: Algeria, Argentina, Australia, Austria, Bahamas, Bahrain, Bangladesh, Barbados, Belgium, Belize, Benin, Bolivia, Botswana, Brazil, Burundi, Cameroon, Canada, Chile, China, Colombia, Congo Dem. Rep., Rep. of Congo, Costa Rica, Cyprus, Denmark, Dominican Rep., Ecuador, Egypt, El Salvador, Fiji, Finland, France, Gabon, Germany, Ghana, Greece, Guatemala, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iran, Ireland, Israel, Italy, Ivory Coast, Jamaica, Japan, Jordan, Kenya, Kuwait, Luxembourg, Madagascar, Malawi, Malaysia, Mali, Malta, Mauritius, Mexico, Morocco, Myanmar, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Pakistan, Panama, Paraguay, Peru, Philippines, Portugal, Senegal, Sierra Leone, Singapore, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Syria, Taiwan, Tanzania, Thailand, Togo, Trinidad and Tobago, Tunisia, Turkey, Uganda, United Arabs Emirates, United Kingdom, United States, Uruguay, Venezuela, Zambia, and Zimbabwe.

TABLE 2
Descriptive Statistics

	Mean	Std. Dev.	Min	Max	N. Obs
Economic Freedom	6.00	1.28	2.09	9.18	612
Political Competition	6.15	3.64	1.00	10.00	612
Rent	2.73	1.51	0.00	6.00	570
Human Capital	6.15	2.78	0.54	13.89	546
Threat	9.63	2.31	0.00	12.00	556
GDP Growth	1.75	5.23	-33.79	35.91	606
(log of) GDP per Capita	3.83	0.50	2.49	4.87	606

TABLE 3
Correlation Matrix

	Economic Freedom	Political Competition	Rent	Human Capital	Threat	GDP Growth	(log of) GDP per Capita
Economic Freedom	1						
Political Competition	0.4220***	1					
Rent	-0.5124***	-0.3890***	1				
Human Capital	0.6812***	0.5042***	-0.5864***	1			
Threat	0.4380***	0.3538***	-0.3201***	0.3873***	1		
GDP Growth	0.1532***	0.1217***	-0.103	0.1481***	0.0888	1	
(log of) GDP per Capita	0.6543***	0.3564***	-0.5927***	0.7865***	0.3082***	0.1258***	1

Note: *** denotes significance at 1% level

TABLE 4A

Political Competition and Economic Freedom: Basic Specification

	Pooled OLS			Within Group			Kiviet bias-corrected WG		
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
EF_{it-1}	0.862*** (0.020)	0.829*** (0.025)	0.829*** (0.025)	0.470*** (0.055)	0.455*** (0.056)	0.457*** (0.054)	0.816*** (0.062)	0.788*** (0.049)	0.847*** (0.070)
PC_{it}	0.021*** (0.007)	-0.120** (0.047)	-0.120 (0.143)	0.007 (0.018)	-0.153* (0.080)	-0.237 (0.234)	0.006 (0.017)	-0.130** (0.056)	-0.531** (0.215)
PC_{it}^2		0.013*** (0.004)	0.013 (0.027)		0.016** (0.007)	0.035 (0.050)		0.014** (0.005)	0.097** (0.046)
PC_{it}^3			0.000 (0.002)			-0.001 (0.003)			-0.005* (0.003)

Notes: The sample includes 102 countries for 6 time periods, for a total of 612 observations. All the models include the constant and time dummies. () denotes standard errors, which are corrected for heteroskedasticity and clustered by country. ***, **, and * denote significance at 1%, 5%, and 10% respectively.

TABLE 4B

Political Competition and Economic Freedom: Basic Specification

	DIF-GMM			SYS-GMM		
	(a)	(b)	(c)	(d)	(e)	(f)
EF_{it-1}	0.796*** (0.153)	0.749*** (0.143)	0.663*** (0.202)	0.786*** (0.125)	0.766*** (0.201)	0.636*** (0.176)
PC_{it}	-0.042 (0.052)	-0.482*** (0.173)	0.411 (1.612)	0.003 (0.030)	-0.759*** (0.272)	0.789 (0.917)
PC_{it}^2		0.041** (0.016)	-0.174 (0.365)		0.065*** (0.024)	-0.254 (0.207)
PC_{it}^3			0.014 (0.022)			0.019 (0.013)
Hansen Test	30.57 [0.231]	36.08 [0.124]	25.35 [0.456]	48.37 [0.591]	49.84 [0.677]	44.85 [0.718]
AR(1)	-2.928 [0.003]	-3.125 [0.002]	-2.761 [0.006]	-3.116 [0.002]	-2.855 [0.004]	-2.784 [0.005]
AR(2)	-1.170 [0.242]	-1.101 [0.271]	-1.501 [0.133]	1.163 [0.245]	-1.067 [0.286]	-1.717 [0.086]
Hansen-in-difference Test				17.80 [0.165]	13.76 [0.391]	19.50 [0.109]

Notes: The sample includes 102 countries for 6 time periods, for a total of 612 observations. All the models include the constant and time dummies. () denotes standard errors, which are corrected for heteroskedasticity and clustered by country. Hansen test: Test for validity of the set of instruments; Hansen in difference test: Test for validity of additional moment conditions. AR(1): Test for the presence of 1st order autocorrelation of residuals; AR(2): Test for the presence of 2nd order autocorrelation in residuals. [] denote p-values. ***, **, and * denote significance at 1%, 5%, and 10% respectively.

TABLE 5A

Political Competition and Economic Freedom: Augmented Models

	Pooled OLS			Within Group			Kiviet bias-corrected WG		
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
EF_{it-1}	0.758*** (0.027)	0.757*** (0.028)	0.759*** (0.027)	0.468*** (0.058)	0.451*** (0.060)	0.452*** (0.058)	0.793*** (0.062)	0.757*** (0.049)	0.845*** (0.068)
PC_{it}	0.004 (0.010)	0.000 (0.054)	-0.100 (0.184)	-0.006 (0.020)	-0.164* (0.091)	-0.186 (0.322)	-0.010 (0.019)	-0.138* (0.074)	-0.475 (0.295)
PC_{it}^2		0.000 (0.005)	0.022 (0.036)		0.016* (0.008)	0.020 (0.066)		0.013* (0.007)	0.081 (0.061)
PC_{it}^3			-0.001 (0.002)			-0.000 (0.004)			-0.004 (0.004)
$Threat_{it}$	0.059*** (0.016)	0.059*** (0.016)	0.059*** (0.016)	0.056** (0.024)	0.058** (0.023)	0.058** (0.024)	0.054*** (0.018)	0.055*** (0.018)	0.055*** (0.021)
Human Capital _{it}	0.043*** (0.013)	0.043*** (0.014)	0.044*** (0.014)	0.031 (0.068)	0.016 (0.070)	0.015 (0.070)	0.022 (0.056)	0.007 (0.051)	0.010 (0.068)
Rent _{it}	-0.059*** (0.023)	-0.059** (0.023)	-0.060** (0.024)	-0.095** (0.046)	-0.090** (0.046)	-0.090* (0.047)	-0.088** (0.042)	-0.082** (0.040)	-0.080 (0.052)

Notes: The sample includes 102 countries for 6 time periods, for a total of 612 observations. All the models include the constant and time dummies. () denotes standard errors, which are corrected for heteroskedasticity and clustered by country. ***, **, and * denote significance at 1%, 5%, and 10% respectively.

TABLE 5B
Political Competition and Economic Freedom: Augmented Models

	DIF-GMM			SYS-GMM		
	(a)	(b)	(c)	(d)	(e)	(f)
EF_{it-1}	0.500*** (0.084)	0.496*** (0.089)	0.476*** (0.139)	0.624*** (0.089)	0.614*** (0.085)	0.586*** (0.090)
PC_{it}	-0.221 (0.070)	-0.654*** (0.195)	-1.382 (0.757)	-0.033 (0.018)	-0.265*** (0.100)	0.506 (0.542)
PC_{it}^2		0.043** (0.020)	0.234 (0.159)		0.022** (0.010)	-0.153 (0.116)
PC_{it}^3			-0.013 (0.010)			0.011 (0.007)
$Threat_{it}$	0.224*** (0.084)	0.270*** (0.080)	0.140*** (0.067)	0.045*** (0.025)	0.054*** (0.030)	0.032*** (0.034)
Human Capital _{it}	0.229 (0.129)	0.156 (0.089)	0.195 (0.148)	0.062 (0.043)	0.061 (0.047)	0.020 (0.053)
Rent _{it}	-0.430** (0.177)	-0.212** (0.097)	-0.329** (0.144)	-0.139** (0.046)	-0.147** (0.045)	-0.163** (0.044)
Hansen Test	45.32 [0.113]	46.89 [0.244]	39.81 [0.162]	69.68 [0.161]	78.13 [0.211]	66.91 [0.173]
AR(1)	-2.73 [0.006]	-2.91 [0.004]	-2.38 [0.017]	-2.74 [0.006]	-2.70 [0.007]	-2.59 [0.010]
AR(2)	-1.13 [0.257]	-0.93 [0.352]	-1.32 [0.187]	-1.51 [0.131]	-1.61 [0.108]	-1.78 [0.075]
Hansen-in-difference Test				24.36 [0.499]	31.24 [0.307]	27.10 [0.351]

Notes: The sample includes 102 countries for 6 time periods, for a total of 612 observations. All the models include the constant and time dummies. () denotes standard errors, which are corrected for heteroskedasticity and clustered by country. Hansen test: Test for validity of the set of instruments; Hansen in difference test: Test for validity of additional moment conditions. AR(1): Test for the presence of 1st order autocorrelation of residuals; AR(2): Test for the presence of 2nd order autocorrelation in residuals. [] denote p-values. ***, **, and * denote significance at 1%, 5%, and 10% respectively.

TABLE 6
Political Competition and Economic Freedom: Test for U-Shape

Panel A - Basic models										
	Pooled OLS		Within Group		Kiviet bias-corrected WG		DIF-GMM		SYS-GMM	
	min	max	min	max	min	max	min	max	min	max
Slope at	-0.094	0.1380	-1.207	0.165	-0.103	0.145	-0.490	0.816	-0.440	0.722
t-value	-2.407 (0.01)	3.918 (0.00)	-1.821 (0.03)	2.457 (0.01)	-2.234 (0.01)	2.620 (0.00)	-2.140 (0.02)	2.737 (0.00)	-2.083 (0.02)	2.830 (0.00)
Overall Significance		2.410 (0.01)		1.820 (0.03)		2.230 (0.01)		2.140 (0.02)		2.080 (0.02)
Extreme Point	4.651		4.799		4.734		4.377		4.404	
Confidence Interval	[2.639; 5.272]		[1.831; 5.902]		[2.472; 6.139]		[2.197; 4.888]		[0.254; 4.872]	
Panel B - Augmented models										
	Pooled OLS		Within Group		Kiviet bias-corrected WG		DIF-GMM		SYS-GMM	
	min	max	min	max	min	max	min	max	min	max
Slope at	-0.032	0.035	-0.133	0.152	-1.112	0.121	-0.421	0.354	-0.237	0.248
t-value	-0.700 (0.24)	0.831 (0.20)	-1.771 (0.04)	1.932 (0.03)	-1.843 (0.03)	1.818 (0.03)	-4.149 (0.00)	2.522 (0.01)	-1.963 (0.02)	2.139 (0.02)
Overall Significance		0.710 (0.23)		1.770 (0.04)		1.840 (0.03)		2.520 (0.00)		-1.960 (0.02)
Extremum Point	5.303		5.201		5.312		5.266		5.629	
Confidence Interval	[3.879; 8.872]		[3.012; 7.732]		[4.098; 6.921]		[3.978; 8.104]		[3.778; 7.987]	

Notes: Interval range: 1 to 10. H_0 : Relationship between economic freedom and political competition is monotone. The confidence interval is calculated by the Fieller method.

TABLE 7

Political Competition and Economic Freedom: Robustness Checks I

	Kiviet bias-corrected WG		DIF-GMM		SYS-GMM	
	(a)	(b)	(c)	(d)	(e)	(f)
EF_{it-1}	0.780*** (0.062)	0.782*** (0.062)	0.483*** (0.089)	0.465*** (0.075)	0.561*** (0.067)	0.561*** (0.066)
PC_{it}	-0.135** (0.064)	-0.135** (0.064)	-0.375*** (0.127)	-0.299** (0.119)	-0.212** (0.091)	-0.190* (0.105)
PC_{it}^2	0.013** (0.006)	0.013** (0.006)	0.031*** (0.011)	0.025** (0.011)	0.019** (0.008)	0.017* (0.010)
$Threat_{it}$	0.055*** (0.019)	0.055*** (0.019)	0.175*** (0.051)	0.167*** (0.060)	0.112*** (0.038)	0.102*** (0.035)
Human Capital _{it}	0.007 (0.070)	0.015 (0.070)	-0.090 (0.131)	-0.084 (0.134)	0.050* (0.028)	0.050 (0.044)
$Rent_{it}$	-0.091** (0.042)	-0.089** (0.042)	-0.326* (0.166)	-0.240* (0.134)	-0.080* (0.046)	-0.084 (0.062)
GDP growth _{it}	0.014*** (0.005)	0.014*** (0.005)	0.030* (0.016)	0.030** (0.013)	0.010* (0.005)	0.009* (0.005)
(log of) GDP per capita _{it}		0.309 (0.256)		0.140 (0.622)		0.046 (0.203)
U-Shape Test	1.72 [0.04]	1.75 [0.04]	2.21 [0.01]	1.89 [0.03]	2.18 [0.01]	1.65 [0.05]
Hansen Test			52.07 [0.216]	53.58 [0.203]	79.31 [0.294]	75.95 [0.323]
AR(1)			-3.32 [0.001]	-3.32 [0.001]	-2.90 [0.004]	-2.86 [0.004]
AR(2)			-1.57 [0.121]	-1.08 [0.280]	-1.14 [0.252]	-1.19 [0.232]
Hansen-in-difference Test					27.24 [0.691]	22.37 [0.787]

Notes: The sample includes 102 countries for 6 time periods, for a total of 612 observations. All the models include the constant and time dummies. () denotes standard errors, which are corrected for heteroskedasticity and clustered by country. Hansen test: Test for validity of the set of instruments; Hansen in difference test: Test for validity of additional moment conditions. AR(1): Test for the presence of 1st order autocorrelation of residuals; AR(2): Test for the presence of 2nd order autocorrelation in residuals. [] denote p-values. ***, **, and * denote significance at 1%, 5%, and 10% respectively.

TABLE 8

Political Competition and Economic Freedom: Robustness Checks II

	Kiviet bias-corrected WG			DIF-GMM			SYS-GMM		
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
EF _{it-1}	0.809*** (0.069)	0.805*** (0.067)	0.747*** (0.053)	0.527*** (0.098)	0.557*** (0.082)	0.607*** (0.129)	0.544*** (0.083)	0.641*** (0.059)	0.584*** (0.070)
T _{it} ≤ 5	-0.075* (0.043)	-0.074* (0.041)	-0.071* (0.038)	-0.203** (0.094)	-0.217*** (0.082)	-0.305*** (0.109)	-0.150** (0.075)	-0.119* (0.066)	-0.167* (0.095)
T _{it} > 5	0.065** (0.031)	0.064** (0.032)	0.070* (0.039)	0.194** (0.085)	0.113* (0.066)	0.176** (0.084)	0.154*** (0.059)	0.082** (0.043)	0.120* (0.069)
Threat _{it}	0.059*** (0.017)	0.059*** (0.019)	0.054*** (0.018)	0.043 (0.043)	0.161*** (0.048)	0.215*** (0.073)	0.046 (0.041)	0.082** (0.032)	0.127*** (0.047)
Human Capital _{it}	-0.004 (0.067)	-0.007 (0.069)	-0.004 (0.060)	0.011 (0.082)	0.076 (0.080)	-0.087 (0.125)	0.052 (0.048)	0.041 (0.033)	0.050 (0.088)
Rent _{it}	-0.070 (0.043)	-0.076** (0.038)	-0.071** (0.036)	-0.255*** (0.074)	-0.221** (0.099)	-0.188* (0.110)	-0.208** (0.076)	-0.151** (0.064)	-0.131* (0.070)
GDP growth _{it}		0.010 (0.006)	0.010 (0.006)		0.015 (0.012)	0.009 (0.021)		0.007 (0.010)	0.013 (0.010)
(log of) GDP per capita _{it}			0.401 (0.266)			0.852 (0.844)			0.339 (0.351)
Hansen Test				38.93 [0.220]	37.63 [0.340]	33.66 [0.481]	60.48 [0.226]	64.37 [0.234]	69.05 [0.273]
AR(1)				-2.93 [0.003]	-3.08 [0.002]	-3.20 [0.001]	-3.09 [0.002]	-3.22 [0.001]	-2.82 [0.005]
AR(2)				-1.64 [0.101]	-1.36 [0.174]	-1.51 [0.131]	-1.46 [0.143]	-1.48 [0.112]	-1.45 [0.146]
Hansen-in-difference Test							21.55 [0.471]	26.74 [0.415]	35.39 [0.284]

Notes: The sample includes 102 countries for 6 time periods, for a total of 612 observations. All the models include the constant and time dummies. () denotes standard errors, which are corrected for heteroskedasticity and clustered by country. Sargan-Hansen test: Test for validity of the set of instruments; Sargan-Hansen in difference test: Test for validity of additional moment conditions. AR(1): Test for the presence of 1st order autocorrelation of residuals; AR(2): Test for the presence of 2nd order autocorrelation in residuals. [] denote p-values. ***, **, and * denote significance at 1%, 5%, and 10% respectively.

TABLE 9

Political Competition and Economic Freedom: Inertia

	Kiviet bias- corrected WG	DIF-GMM	SYS-GMM
	(a)	(b)	(c)
EF_{it-1}	0.764*** (0.073)	0.259** (0.134)	0.518*** (0.070)
PC_{it}	-0.182*** (0.063)	-0.748** (0.293)	-0.549*** (0.149)
PC_{it}^2	0.016*** (0.006)	0.051* (0.030)	0.048*** (0.013)
$Threat_{it}$	0.057*** (0.020)	0.164** (0.063)	0.059** (0.025)
Human Capital _{it}	0.052 (0.088)	0.941** (0.369)	0.235** (0.096)
$Rent_{it}$	-0.044 (0.039)	0.162 (0.276)	-0.040 (0.060)
PC_{it-1}	0.099 (0.073)	0.250 (0.350)	0.223* (0.127)
PC_{it-1}^2	-0.007 (0.007)	-0.019 (0.036)	-0.020 (0.012)
$Threat_{it-1}$	0.016 (0.016)	0.154 (0.115)	0.040* (0.021)
Human Capital _{it-1}	-0.089 (0.091)	-0.889** (0.341)	-0.264*** (0.098)
$Rent_{it-1}$	-0.072 (0.045)	-0.518** (0.249)	-0.216*** (0.067)
Hansen Test		37.26 [0.113]	67.11 [0.102]
AR(1)		-2.25 [0.024]	-3.80 [0.000]
AR(2)		-0.57 [0.569]	-1.07 [0.284]
Hansen-in-difference Test			29.85 [0.230]

Notes: The sample includes 102 countries for 6 time periods, for a total of 612 observations. All the models include the constant and time dummies. () denotes standard errors, which are corrected for heteroskedasticity and clustered by country. Hansen test: Test for validity of the set of instruments; Hansen in difference test: Test for validity of additional moment conditions. AR(1): Test for the presence of 1st order autocorrelation of residuals; AR(2): Test for the presence of 2nd order autocorrelation in residuals. [] denote p-values. ***, **, and * denote significance at 1%, 5%, and 10% respectively.

TABLE 10
Political Competition and Economic Freedom: Causality

	(a)	(b)
EF_{it-1}	0.489*** (0.085)	0.335*** (0.115)
$Threat_{it}$	0.080** (0.037)	0.108* (0.064)
Human Capital $_{it}$	0.128* (0.073)	0.205*** (0.079)
$Rent_{it}$	-0.035 (0.063)	0.096 (0.060)
PC_{it-1} and PC^2_{it-1}	51.32 [0.000]	
$PC^1_{it-1}, \dots, PC^j_{it-1}, \dots, (PC^1)_{it-1}^2, \dots, (PC^j)_{it-1}^2$		221.32 [0.000]
Hansen Test	45.76 [0.128]	24.76 [0.379]
AR(1)	-2.518 [0.012]	-2.67 [0.007]
AR(2)	-1.350 [0.177]	-0.941 [0.347]

Notes: The sample includes 102 countries for 6 time periods, for a total of 612 observations. All the models include the constant and time dummies. () denotes standard errors, which are corrected for heteroskedasticity and clustered by country. Hansen test: Test for validity of the set of instruments. AR(1): Test for the presence of 1st order autocorrelation of residuals; AR(2): Test for the presence of 2nd order autocorrelation in residuals. [] denote p-values. ***, **, and * denote significance at 1%, 5%, and 10% respectively. In model (a), the value refers to the χ^2 statistic under the null hypothesis that the coefficients associated to PC_{it-1} and PC^2_{it-1} are not jointly statistically significant. In model (b), the value refers to the χ^2 statistic under the null hypothesis that the coefficients associated to the j-th PC^j_{it-1} and $(PC^j)_{it-1}^2$ terms are not jointly statistically significant.