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Does investment spur growth everywhere? Not where institutions are weak

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CEB Working Paper N° 13/030
August 2013

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* Acknowledgments: We thank Philipp Harms, Heiner Mikosch, Niklas Potrafke, and seminar participants at Centre Emile Bernheim, at the Beyond Basic Questions workshop in Engelberg, and at the Silvaplana workshop in Political Economy for useful comments. Remaining errors must be blamed on the authors.

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1. Introduction

While a dollar of investment costs a dollar everywhere, it does not always and everywhere result in a dollar of efficient capital. In other words, as Pritchett (2000) points out, "cumulated, depreciated, investment effort" is not capital. As he points out, various mistakes, distortions, and inefficiencies drive a wedge between the cost of capital and the amount of accumulated capital. Private investors can make mistakes, and overestimate the value of an investment. Unforeseen technological changes or price shifts may turn the value of a costly investment to zero. There are good reasons to believe that public investment is even more likely to result in low capital accumulation. First, public investors make mistakes too. Second, they do not face the same incentives as private investors to equate the cost of an investment with its value, because return maximization is not necessarily their objective. Instead, they face incentives of their own, that may result in over-investment, unproductive spending, or excessive depreciation. Where the institutional environment is deficient, waste is likely. This is documented by Tanzi and Davoodi (2002), who observed that corruption correlates with larger public expenditures, but with smaller maintenance expenditures and lower infrastructure quality. Similarly, de la Croix and Delavallade (2009) find that poor countries with a lower rule of law invest more in housing and physical capital and less in education. Moreover, inefficiencies in public investment are likely to spill over to private investment. Reinikka and Svensson (2002) thus observe that poor provision of public infrastructure services reduces both the quantity and the efficiency of investment by Ugandan firms.

O'Toole and Tarp (2012) report firm-level evidence that the efficiency of investment is lower in countries where corruption is more widespread. Those findings point out to the notion that the marginal impact of recorded investment on growth in a country should be a function of the quality of that country's institutions.

Nevertheless, empirical studies of growth, following classic papers such as Barro (1991), Mankiw *et al.* (1992), or Levine and Renelt (1992), routinely use the cost of investment as a proxy for capital accumulation in linear regressions. The impact of investment is, therefore, assumed independent of the quality of the institutional environment. The issue is that if the same cost of investment leads to different amounts of accumulated productive capital in different countries, then the relation between investment and growth should not be homogeneous across countries. Moreover, the estimated impact of investment in growth regressions is likely biased downward, because linear growth regressions pool together countries where each invested dollar leads to a dollar of productive capital, and countries where an invested dollar leads to much less than a dollar of productive capital. Policy recommendations based on their results would consequently be equally biased.

Admittedly, several studies, such as Durlauf *et al.* (2001), Maasoumi *et al.* (2007), or Henderson *et al.* (2012), have used non-linear techniques following Durlauf and Johnson (1995) to examine the determinants of growth. Their common message is that there is indeed heterogeneity in the estimated coefficients. Mittnik and Neumann (2003) and Kalaitzidakis and Tzouvelekas (2011) reached a similar conclusion respectively applying time series techniques on growth in Germany and a quadratic model on a panel of countries. However, while the quality of institutions is central to the impact of investment on growth, the literature allowing for non-linearities in growth determinants has almost entirely neglected that possibility. Two exceptions stand out, but their conclusions are contradictory. Minier (2007) estimates standard cross-section growth regressions allowing coefficients to vary as a function of the initial level of constraint on the executive. She concludes that, while a greater constraint on the executive can condition the impact of economic policies, it does not condition the impact of investment. Also using standard cross-section growth regressions, Hall *et al.* (2010) interact the investment rate with a measure of the risk of expropriation, and reach the opposite conclusion. Namely, they find that the marginal impact of investment is positive in low-risk countries and negative in high-risk countries.

Despite their conflicting results, the reliance of Minier (2007) and Hall *et al.* (2010) on cross-country regressions prevents them from controlling for unobserved heterogeneity, as can be done in a panel setting. Moreover, neither controls for endogeneity, which is a key issue in the institutions and growth literature, as Acemoglu *et al.* (2001) point out.

The aim of the present paper is precisely to take into account the notion that the impact of investment on growth is conditional on institutional quality, while carefully addressing the issues of unobserved heterogeneity, thanks to the panel structure of our dataset. More specifically, we use panel growth regressions *à la* Islam (1995) with fixed country-effects, estimated with both OLS and GMM dynamic panel-data regressions *à la* Arellano-Bond (1991). The GMM estimator is used to deal with the risk of an endogeneity bias, although one should remain cautious when interpreting GMM estimates, as Bazzy and Clemens (2031) point out.

We obtain evidence of a positive impact of investment on growth. However, in line with the notion that there may be a larger wedge between the cost of investment and capital accumulation in countries with ineffective institutions, we observe that the positive impact of investment on growth is only observable for countries where the quality of the institutional framework is high enough while the impact is insignificant in countries with weak institutions.

To reach those conclusions, the rest of the paper is organized as follows. The next section describes our empirical strategy. Section 3 reports our baseline findings, while section 4 provides a series of robustness checks. Section 5 concludes.

2. Empirical Strategy

Our key contention is that the quality of the institutional environment is crucial to the impact of investment on growth, and that the marginal effect of investment on growth to is a function of institutional quality. In this section, we first present the econometric model that we use to test that contention, and then describe the data to which it was applied.

2.1. Econometric Specification

To measure how the marginal effect of investment on economic growth varies with institutional quality, we estimate a standard panel growth regression model *à la* Islam (1995) while controlling for the quality of institutions and an interaction term between the quality of institutions and investment.[1]

[1] Following common practice in panel-data estimation, the sample period (1984-2009) is divided into five shorter periods of five years each, except the first sub-period which counts six years. More precisely, the periods are: 1984-1989, 1990-1994, 1995-1999, 2000-2004, and 2005-2009. Using five-year periods allows using a panel structure while abstracting from short-run output fluctuations.

$$g_{it} = \alpha_0 \log(y_{0it}) + \alpha_1 \log(I_{it}) + \alpha_2 Inst_{it} + \alpha_3 \log(I_{it}) \times Inst_{it} + \Omega' X_{it} + \delta_i + \tau_t + \varepsilon_{it} \quad (1)$$

where

- $g_{it} \equiv \log(y_{1it}) - \log(y_{0it})$ is the average growth rate of the real per capita GDP of country *i* over period *t*;
- y_{0it} is the level of country *i*'s real per capita GDP at the beginning of period *t*;
- I_{it} is the average ratio of real gross domestic investment to real GDP in country *i* over period *t*;
- $Inst_{it}$ is the average value of an index measuring institutional quality in country *i* and period *t*;
- X_{it} is a column vector that includes control variable;
- Ω' is a vector of coefficients;
- δ_i is the individual country-specific fixed effect;
- τ_t is the period-specific fixed effect;
- ε_{it} is the idiosyncratic error term with mean equal to zero.

The marginal effect of investment on economic growth in country *i* over sub-period *t* can be computed by differentiating Equation (1) with respect to the log of the investment ratio. It reads

$$\frac{\partial g_{it}}{\partial \log(I_{it})} = \alpha_1 + \alpha_3 Inst_{it} \quad (2)$$

The above expression clearly shows that our specification lets the marginal effect of investment be a function of the quality of institutions. The key parameters of interest, here, are α_1 and α_3.[2]

Under the hypothesis we follow in this paper, the marginal effect of investment on growth should increase with institutional quality and be significantly positive in countries with high institutional quality. If the institutional indicator $Inst_{it}$ increases with institutional quality, then our assumption implies that α_3 be positive. The hypothesis does not allow us to a priori predict the sign of α_1. That parameter could be positive and significant but small, if

[2] For a discussion of the specification of interactive models, the interested reader may refer to Friedrich (1982), Braumoeller (2004), and Brambor *et al.* (2005).

the marginal impact of investment remains positive in countries with low-quality institutions, where the index is close to zero. It may even be insignificant or negative, if the low quality of institutions completely mutes the impact of investment on growth, or if it leads investment to generate extra distortions that in fact slow down growth.

Beside its interaction with investment, institutional quality is expected to have a direct effect on growth. As North (1990), Knack and Keefer (1995), or Acemoglu and Johnson (2005) point out, the security of property rights and government effectiveness are probably the most relevant determinants of long-run economic growth, but other dimensions of a country's institutional framework, such as democratic accountability, may also play a role, as Groenewold and Tang (2007) observe. Moreover, not controlling for both terms of the interaction would therefore likely bias the estimated coefficient of the interaction term, which is why we control for the level of institutional quality.

To determine the other control variables, we follow the standard specification of Islam (1995). The first control variable is the initial level of real GDP per capita in each sub-period. Its inclusion aims at accounting for the absolute convergence hypothesis emphasized in neoclassic growth models. If economies converge, poor economies should grow faster than rich ones, and the growth rate of real GDP per capita should be negatively correlated to the initial level of real GDP per capita.

Secondly, we control for the stock of human capital. More precisely, we control for the secondary-school enrolment rate.[3] It is defined as the ratio of total enrolment over the population of the age group corresponding to the secondary level of education. An improvement in the measure of human capital is expected to have a positive impact on growth, in line with Mankiw *et al.*'s (1992) result.

Thirdly, we control for population growth. In a neoclassic framework, faster population growth slows down the increase of the per capita stock of physical capital. It should, therefore, reduce growth, and we expect its coefficient to be negative.

Finally, we control for average openness to international trade over the sub-period. Openness is used to proxy for the exposure of an economy to foreign markets. In Equation (1), openness to trade is defined as the ratio of the arithmetic mean between exports and imports to GDP. Although the literature is not consensual on the magnitude of the effect, the

[3] Gross enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Secondary education complements the provision of basic education that began at the primary level, and aims at laying the foundations to lifelong learning and human development, by offering more subject- or skill-oriented instruction using more specialized teachers.

standard finding is that openness leads to faster growth, as Winters (2004) argues. We therefore expect a positively signed coefficient for openness.

Following Mankiw *et al.* (1992), and others, all variables are taken in logarithm, except for the composite index of institutional quality. As Méon and Sekkat (2005) point out, considering either the level or the logarithm of institutional variables does not affect regression results.

In contrast to Minier (2007) and Hall *et al.* (2010), the panel structure of our dataset allows us to address the issues of unobserved heterogeneity and, to some extent endogeneity. Namely, we can control for unobserved heterogeneity using panel growth regressions *à la* Islam (1995) estimated using fixed country-specific effects. Moreover, we complement those regressions with GMM panel-data regressions *à la* Arellano-Bond (1991). Another advantage of our approach is that it allows institutional quality to vary over time, while Minier (2007) had to use executive constraint in the first year of her forty year long period of study and Hall et al. (2010) used the average value of institutional quality over their period of study.

Other differences between the works of Minier (207) and Hall *et al.* (2010) are worth pointing out. Minier (2007) measures institutions by the level of constraint on the executive, while we use a broader measure that is meant to encompass a large number of dimensions of the institutional framework. Moreover, she measures the level of constraint on the executive by a dummy variable constructed from a continuous index reported in the PolityIV dataset, while we use a continuous measure so as to let the marginal impact of investment on growth evolve continuously with the quality of institutions and avoid threshold effects. We also differ from Hall *et al.* (2010) in that we focus specifically on investment in physical capital while they consider both human and physical capital. By doing so, we can devote more space to examining the statistical and quantitative significance of the marginal impact of investment on growth. Moreover, we systematically control not only for investment and its interaction with institutional quality, but also for the level of institutional quality, thereby avoiding that the coefficient of the interaction term capture the direct effect of institutional quality on growth.

2.2. Data

We use two key sets of data to conduct the empirical analysis: institutional indicators and macroeconomic data. These two data sets are described hereafter.

2.2.1. Institutional Data

To gauge the quality of institutions, we follow Knack and Keefer (1995) and Hall and Jones (1999), and use the *International Country Risk Guide* (ICRG) political risk rating published by the *Political Risk Services Group*. As Knack and Keefer (1995) point out, that index measures the quality of institutions that are closely related to those emphasized by North (1990). Moreover, the ICRG index has been published yearly since 1984, and can, therefore, be used in a panel setup. It is thus particularly suited for our analysis.

The ICRG political risk rating is computed as a weighted average of 12 individual political risk indicators, based on experts' subjective evaluations. It ranges from zero to ten, with higher values reflecting a better quality of institutions.[4]

To use the indicator in our panel regressions, we averaged it over each sample sub-period. In our sample, the composite measure of institutional quality, averaged over each sample sub-period, ranges from 13.60 to 93.48. These two extreme values respectively correspond to Ukraine (1995-1999) and Finland (2000-2004), while the country displaying a political risk close to the average is South Africa, with a value of 67.96 over 2000-2004.

2.2.2. Macroeconomic Data

Most macroeconomic data are taken from the *Penn World Table* v7.0 constructed by Heston *et al.* (2011). In particular, data on real GDP per capita, real gross domestic investment, openness to trade, and population growth were found in the *Penn World Table*. Initial secondary-school enrolment rates were retrieved from the *Global Development Finance and World Development Indicators* database of the World Bank.[5]

All variables are averaged over five-year spans, except for the initial levels of real GDP per capita. The full sample spans the 1984-2009 period and consists of both developed and developing countries, thereby mitigating any concern about sample selection bias. Due to missing data, the panel is unbalanced. The number of countries included in the regressions is 98 and the number of observations is 326.

3. Empirical Analysis

In this section, we first discuss our baseline findings, before checking their robustness.

3.1. Empirical Results for Fixed-Effects and GMM Regressions

[4] Descriptive statistics and the correlation Matrix are reported in Tables A1and A2 in the appendix.
[5] Note that the mechanisms that we have so far emphasized could be amplified if the quality of investment data was poorer in countries with poorer institutions. This may be due to a sheer attenuation bias, or to the fact that governments in those countries artificially inflate investment figures.

Table 1 reports the results for fixed-effects and GMM regressions with fixed country effects.[6] To see whether the inclusion of a multiplicative interaction term is warranted, Equation (1) is estimated both with and without the interaction term.

*** Insert Table 1 around here ***

Confronting the goodness-of-fit measures of the two estimated fixed-effects models, reported in columns 1.1 and 1.2, we observe that the inclusion of the interaction term results in a slightly larger adjusted *R*-squared. In other words, the multiplicative panel data model described in Equation (1) seems to explain more of the variation in the average growth rate of real GDP per capita than would a simple additive model. Moreover, the coefficient of the interaction term is significant at the 1% level. The evidence reported in Table 1, therefore, supports the contention that investment and institutional quality do indeed interact. Consequently, we will focus the discussion on the results for the interactive term.

Turning to the estimated coefficients, we see that control variables exhibit the expected sign or are insignificant at standard levels of statistical significance. The initial level of real GDP per capita enters the growth equation with a significantly negative sign, which validates the conditional convergence hypothesis. The estimated coefficient attached to international openness is positively signed and significant at the five-percent level. Schooling and population growth, do not appear to be significantly different from zero. Admittedly, schooling exhibits a negative sign, but that sign is only significant at the ten-percent level, and only for the least preferred specification, specification 1.1.

The key coefficients of interest are those attached to the investment ratio and the interaction term, and the marginal effect they imply. Those coefficients turn out to be consistent with the hypothesis that the wedge between cumulated investment and the increase in the capital stock is larger in countries with defective institutions. On the one hand, the estimated coefficient of investment is negative and significant at the ten-percent level, implying that the marginal effect of investment would be negative in countries with extremely deficient institutions. On the other hand, the estimated coefficient of the interaction term appears to be significantly positive at the one-percent level, indicating that the marginal effect of investment increases with the quality of institutions.

[6] We also ran random-effects regressions. However, as the Hausman test systematically rejects the random-effects model (see Table 1), we only report the results for fixed-effects regressions.

As individual coefficients are almost meaningless when looked at separately, the middle panel of Table 1 reports the point estimates and standard errors of the marginal effects implied by estimation 1.2, for the lowest (13.60), mean (67.96), and highest (93.48) values of the ICRG index in the sample.[7] In line with our expectations, the marginal effect of investment on growth is significantly positive at the one-percent level for the highest level of institutional quality. It is still positive and significant at the one-percent level for the mean level of institutional quality. By contrast, the marginal effect of investment on growth is not statistically different from zero for the lowest value of the institutional index in regression 1.2. This is evidence that a poor quality of institutions is related to unproductive investment expenditure, or that the cost of capital (i.e. investment effort) significantly overstates capital accumulation in countries with weak institutions.

Next, we estimate expression 1 with GMM. The columns 1.3 and 1.4 of Table 1 report the results of panel-data regressions *à la* Arellano-Bond (1991).[8] The control variables still exhibit their expected sign or are statistically insignificant. The initial level of real GDP per capita is negatively signed and significant at the one-percent level. The estimated coefficient attached to the secondary school enrolment rate is non-significant. The coefficient of openness appears to be significantly positive at the five- or ten-percent level. As before, population growth is statistically insignificant at standard levels of significance.

Most of all, we observe that the key estimated coefficients of interest – namely, those attached to the investment ratio and the interaction term – are respectively negative and significantly different from zero at the ten-percent level, and significantly positive at the five-percent level, which is in line with previous results.

As before, we also report the point estimates and standard errors of the marginal effect of investment, computed at the minimum, mean, and maximum values of the ICRG index, in the middle panel of Table 1. Stealing a glance at that panel is enough to observe that marginal effects are in line with those presented in the previous sub-section. The marginal effect of investment is positive and statistically significant at the one-percent level for its mean and highest values. It remains positive and statistically significant for the lowest value of the ICRG index, but only at the ten-percent level. Moreover, its magnitude becomes very low. Again, the empirical evidence reported here suggests that the positive impact of investment on

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[7] 13.60 corresponds to the value of the ICRG index for Ukraine during the 1995-1999 period. The mean value of 67.96 is of the same order of magnitude as the index of Venezuela during the 1990-1994 period or South Africa during the 2005-2009 period. The 93.48 value corresponds to Finland during the 1990-1994 period.

[8] The number of lags used as instruments is set so as to remove autocorrelation in the residuals.

growth essentially materializes for countries where the quality of the institutional environment is high enough.

*** Insert Figure 1 around here ***

Figure 1 summarizes those results by displaying the point estimate and the five-percent confidence interval of the marginal effect of investment as a function of the sample values of the ICRG index, based on the GMM estimation 1.4. More precisely, the marginal effect of investment on growth is significantly positive for 311 observations (84 countries) out of the 312 observations in our sample. The threshold value of the ICRG index from which the marginal effect of investment becomes significantly positive is 28.93, corresponding to Sudan over 1996-2000.

Our estimations easily lend themselves to a quantitative interpretation. As both the dependent and the independent variables are taken in logarithms, estimated marginal effects indeed measure the elasticity of income to the investment ratio. The results of our favored specification, regression 1.4, imply that the elasticity of income to the investment ratio is 1.463 in Finland, the country with the highest ICRG score, around 1.051 in Venezuela, whose ICRG score is similar to our sample average, and only 0.174, i.e. eight times less than in Finland, for countries with an ICRG equivalent to that of Ukraine in the second half of the 1990s.[9]

3.2. Robustness Checks

Our findings have so far relied on the ICRG index of governance. That index is computed as a weighted average of twelve individual components, each assessing a different dimension of institutions. All dimensions may not, however, affect the impact of investment on growth in the same way. To obtain a finer description of the impact of institutional quality on the marginal effect of investment, and as a robustness check, we now use individual components, instead of the global ICRG indicator, as measures of institutional quality and in the interaction term. Our key finding seems to be driven by three components out of twelve: Government stability, Corruption, and Law and Order. The relation of the other nine with growth and investment does not seem to exhibit any clear or significant pattern. Those components are Investment Profile, Socioeconomic Conditions, Internal Conflict, External Conflict, Military

[9] Note that those estimates are of the same order of magnitude as those obtained in previous studies, such a Mankiw et al. (1992) or Islam (1995).

in Politics, Religious Tensions, Bureaucracy Quality, Democratic accountability, and Ethnic Tensions. Comparing the two sets of components gives an insight into the dimensions of the institutional framework that affect the efficiency of investment. By and large, those dimensions are all related to the safety of investment and the soundness of the legal and regulatory framework.

The meaning of the three sub-indices that lead to meaningful results can moreover be interpreted in light of the results of Berggren et al. (2012, 2013). Berggren et al. (2012) apply principal component analysis to the twelve basic sub-indices of the ICRG political risk index. The first component that their analysis determines, and that they label "legal quality", precisely loads heavily on Corruption and Law and Order. Moreover, they find that that component positively correlates with growth. They also find that the government stability index has the largest factor loading on the second component of their analysis, to which they refer to as the "policy" component. Berggren et al. (2013) also consider the twelve basic ICRG political sub-indices, but apply principal factor analysis, and only consider European countries and Israel. They find that Corruption and Law and order heavily load on the same dimension, while Government stability loads heavily on the third dimension representing policies. In our sample, a factor analysis also reveals that the first factor loads heavily on Corruption and Law and Order, while the third factor loads heavily on Government stability. Our findings may thus be interpreted as generally meaning that it takes a minimum level of legal quality and stability for investment to affect growth. By contrast, the components of the ICRG index that are not consistently related to growth tend to measure various forms of political tensions, but are unrelated to the regulatory environment. A first finding of this section is therefore that tensions as such do not affect the quality of investment. Conversely, the efficiency of investment is affected by facets of governance that affect the quality and the stability of the regulatory framework.

To save space, Table 2 only reports our preferred estimation, namely GMM dynamic panel-data regressions *à la* Arellano-Bond (1991).

*** Insert Table 2 around here ***

The results presented in Table 2 are consistent with previous results. In particular, the estimated coefficient of the interaction term is positively signed and significant at the one-percent level in all regressions. In any case, only marginal effects are really meaningful. As in the previous sub-section, the middle panel of Table 2 reports the estimated values of the marginal effect of investment on growth, using the minimum, mean, and maximum values of the three individual political risk components considered in this sub-section. The same pattern appears for each of those indices. Namely, the elasticity of income to investment is the lowest in weak institutional environments and increases with the quality of institutions. The ratio of the elasticity of income to investment between the country with the largest institutional score and the country with the worst score ranges from 3.19, for the Government stability component, to 7.75, for the Corruption component. It is 4.88 for the Law and order component. All those results are in line with the hypothesis that the wedge between investment and accumulated capital is lower in countries with more deficient institutions.

4. Conclusion

In this paper, we tried to disentangle the relation between the quality of institutions and the marginal effect of investment on growth. We tested the hypothesis that the impact of investment on growth is conditional, and thus dependent, on the quality of institutions. We empirically tested this hypothesis on a panel of up to 98 countries spanning the 1984-2009 period. Practically, we did so by adding a multiplicative interaction between investment and institutional quality to the set of usual control variables, allowing to compute estimated marginal effects that vary with institutional quality. Firstly, using panel growth regressions *à la* Islam (1995) with fixed country-effects, we could control for unobserved heterogeneity. Then, we used the GMM panel-data regressions *à la* Arellano-Bond (1991). Finally, we also conducted the latter type of regressions using the relevant components of the ICRG index of institutional quality, individually, in order to see whether the results are affected, as a robustness check. That robustness check revealed that the dimensions of the institutional framework that affect the efficiency of investment are related to the safety of investment and the quality of the regulatory framework. Conversely, political tensions *per se* do not seem to affect the marginal impact of investment.

Our findings suggest that the marginal impact of investment on growth is an increasing function of institutional quality. Moreover, that marginal impact becomes very small, or even insignificant, in countries where the quality of institutions is very low.

The key policy implication of our findings is that the success of policies encouraging investment to foster growth, such as big push programs, is conditional on institutional quality. Governments and international organizations wishing to implement such policies should therefore first make sure that the country's institutional framework is sufficiently strong. If not, then institutions should be improved before the investment program is implemented. Otherwise, the invested capital will be wasted.

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6. Appendix

*** Insert Table A1 around here ***

*** Insert Table A2 around here ***

Figure 1: Marginal effect of investment as a function of the ICRG index (regression 1.4)

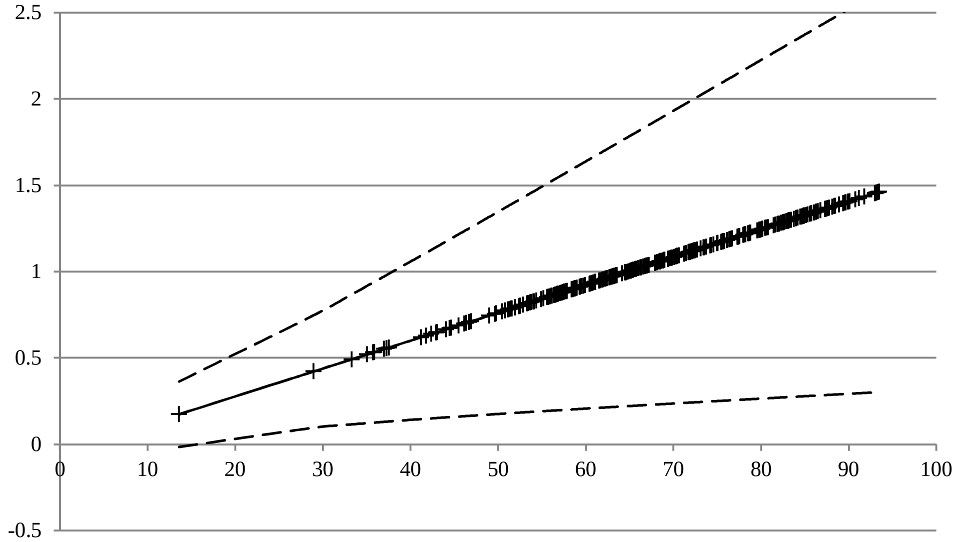

Table 1: Fixed-effects and GMM regression results

	FE without interaction	FE with interaction	GMM without interaction	GMM with interaction
	1.1	1.2	1.3	1.4
Initial real GDP per capita	-0.383	-0.42	-0.453	-0.448
	(5.602)***	(6.599)***	(5.515)***	(5.951)***
School enrolment rate	-0.053	-0.029	0.01	0.012
	(1.802)*	(1.029)	(0.164)	(0.220)
Openness	0.116	0.137	0.087	0.081
	(2.818)***	(3.349)***	(2.025)**	(1.906)*
Population growth	-0.026	-0.017	-0.008	-0.015
	(0.967)	(0.666)	(0.283)	(0.603)
Investment ratio	0.118	-0.267	-0.076	-0.046
	(3.124)***	(1.645)*	(0.629)	(0.425)
ICRG index	0.007	1.541	0.515	0.46
	(5.18)***	(3.961)***	(4.402)***	(4.475)***
Investment ratio × ICRG index		0.601		1.614
		(2.553)***		(2.382)***
Marginal effect of investment at min. ICRG	-	-0.185	-	0.174
	-	(1.411)	-	(1.832)*
Marginal effect of investment at mean ICRG	-	0.142	-	1.051
	-	(3.931)***	-	(2.561)***
Marginal effect of investment at max. ICRG	-	0.295	-	1.463
	-	(4.123)***	-	(2.520)***
Number of observation.	324	324	312	312
Number of countries	85	85	85	85
Adjusted R^2	0.72	0.74	-	-
Random effect test; P-value	-	0.00	-	-
Fixed effect test; P-value	-	0.00	-	-
Test of overidentifying restrictions; P-value	-		0.25	0.12

Absolute t-statistics in parentheses. Standard Errors computed from heteroscedastic-and autocorrelation consistent. ***: significant at the 1% level, **: significant at the 5% level, *: significant at the 10% level.

Table 2: GMM regression results using individual political risk components

	Government Stability	Corruption	Law and Order
	2.3	2.1	2.2
Initial real GDP per capital	-0.333	-0.359	-0.366
	(6.71)***	(8.027)***	(7.418)***
Initial school enrolment rate	0.035	-0.021	-0.001
	(0.721)	(0.688)	(0.063)
Openness to trade	0.036	0.217	0.024
	(0.918)	(1.977)*	(0.586)
Population growth	-0.092	-0.078	-0.083
	(3.197)***	(2.324)***	(2.513)***
Investment ratio	0.137	0.117	0.115
	(4.194)***	(3.085)***	(3.723)***
ICRG component	0.013	-0.04	0.018
	(3.133)***	(1.374)	(2.129)***
Investment ratio × ICRG component	0.05	0.131	0.125
	(2.572)***	(2.020)***	(2.883)***
Marginal effect of investment at min. ICRG	0.137	0.117	0.177
	(4.194)***	(3.085)***	(5.585)***
Marginal effect of investment at mean ICRG	0.324	0.507	0.572
	(4.614)***	(2.687)***	(3.767)***
Marginal effect of investment at max. ICRG	0.437	0.907	0.864
	(3.925)***	(2.357)***	(3.428)***
Number of observation.	263	273	274
Number of countries	85	85	85
Test of overidentifying restrictions; P-value	0.27	0.17	0.16

Absolute robust standard errors are displayed in parentheses. ***: significant at the 1% level, **: significant at the 5% level, *: significant at the 10% level.

Table A1: Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Real GDP growth per capita	346	0.095	0.131	-0.663	0.482
Initial real GDP per capita	346	8.795	1.218	5.535	11.027
School enrolment rate	346	4.156	0.606	1.675	5.053
Openness to trade	346	1.875	0.211	0.560	2.182
Population growth	346	-2.226	0.706	-8.022	-1.119
Investment ratio	346	-1.537	0.265	-2.669	-0.845
ICRG index	346	67.964	13.673	13.600	93.483
Investment ratio x *ICRG index*	346	-103.768	24.503	-154.457	-18.454

Table A2: Correlation matrix

	Real GDP growth per capita	*Initial real GDP per capita*	*School enrolment rate*	*Openness to trade*	*Population growth*	*Investment ratio*	*ICRG index*	*Investment ratio* x *ICRG index*
Real GDP growth per capita	1.000							
Initial real GDP per capita	0.123	1.000						
School enrolment rate	0.227	0.824	1.000					
Openness to trade	0.227	0.514	0.487	1.000				
Population growth	-0.170	-0.315	-0.443	-0.210	1.000			
Investment ratio	0.477	0.206	0.317	0.125	-0.099	1.000		
ICRG index	0.342	0.747	0.616	0.580	-0.287	0.192	1.000	
Investment ratio x *ICRG index*	-0.004	-0.545	-0.360	-0.443	0.202	0.470	-0.762	1.000