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INSTITUTIONS, VOLATILITY AND INVESTMENT[†]

Abstract

Countries with strong executive constraints have lower growth volatility but similar average growth to those with weak constraints. This paper argues that this may explain a strong reduced-form correlation between executive constraints and inflows of foreign investment. It uses a novel dataset of Dutch sector-level investments between 1983 and 2010 to explore this issue. It formulates an economic model of investment and uses data on the mean and variance of productivity growth to explain the relationship between investment inflows and executive constraints. The model can account for the aggregate change in inflows when strong executive constraints are adopted in terms of the reduction in the volatility in productivity growth. The data and model together suggest a natural way of thinking about country-specific heterogeneity in investment inflows following the adoption of strong executive constraints.

JEL Classification: F21, F23 and O43
Keywords: democracy, executive constraints, foreign investment, political risk and volatility

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1 Introduction

It is now universally acknowledged that political institutions play an important role in shaping patterns of development and growth.[1] Yet, knowledge about the implications of the specific mechanisms remains quite limited and reduced-form correlations yield little insight into this. Hence an important part of the research agenda on institutions and growth is to study specific channels of influence and their associated outcomes.

The effect of institutions on investment, is an important element of this research agenda. Here, for reasons of data availability, we focus on cross-border investment flows by multinational firms. Increases in cross-border capital flows were a notable aspect of the recent era of globalization and the choice of countries for foreign investment provides a potentially important channel for political institutions to have influence. There are good reasons to believe that political institutions will shape the risk/return profile that multinational companies face. Indeed, when PricewaterhouseCoopers and Eurasia Group conducted a survey amongst 100 of their largest customers, two thirds answered that political risk was either a major concern or at least very important and therefore integrated into the risk management process.[2]

This paper explores the link between the strength of executive constraints and foreign investment flows. We explore the possibility that executive constraints encourage investment because they increase trend productivity growth and\or reduce the variance of productivity shocks affecting growth. We show that this is consistent with a political model where strong executive constraints reduce the discretionary power of the executive. We argue that, theoretically, this is likely to lower policy-induced volatility while having an ambiguous effect on mean growth.

To explore this empirically, we use a panel of sector-level data on Dutch multinationals between 1983 and 2010 provided to us by the Dutch central bank. We know for each sector where it chose to invest over this period. The paper first establishes a robust reduced-form correlation between strong executive constraints and foreign investment flows. To explain this, we develop a model where the strength of executive constraints can influence both the mean and variance of productivity growth, thereby affecting investment incentives. Applying this model to the data, we find that having strong executive constraints is associated with a reduction in the volatility of productivity growth and is also positively correlated with country risk assessments by the insurance industry. We then show that this reduction in the variance of productivity growth can account for the observed magnitude in the reduced-form relationship between investment inflows and executive constraints. This offers a distinctive perspective on the role of institutions and the mitigation of policy risk.

We demonstrate the usefulness of this theory-driven approach by using it to simulate country-by-country counterfactual investment flows for countries that adopted strong executive constraints. The findings suggest that the reduction in the volatility of productivity shocks had a larger impact on investment inflows in some

[1] See, for example, North (1990), North and Thomas (1973), Acemoglu et al (2005) and Acemoglu and Robinson (2012) for big picture discussions.

[2] Accordingly, more than two thirds of mulitnationals reported political risk entered at least to some extent when deciding on new acquisitions and ventures. See http://www.pwc.com/us/en/risk-compliance/assets/PwC_PoliticalRisk_052006.pdf (accessed on 22/05/2014).

cases. For example, the estimates suggest that investment inflows to Poland and South Africa would have been less than half what was observed had productivity growth not become more stable after the adoption of strong executive constraints.

This paper is related to the vast literature on democracy and economic performance such as Barro (1996), Papaioannou and Siourounis (2008), Persson and Tabellini (2009a,b), and Przeworski and Limongi (1993). It is now generally recognized that there is no simple empirical story to be told and that there could be considerable heterogeneity as discussed in Persson and Tabellini (2009b). Of more specific relevance are those papers that have pointed out democracies are less volatile than non-democracies; see, for example, Acemoglu et al (2004), Almeida and Ferraira, (2002), Moborak (2005), and Weede (1996).

Also relevant to what we do is the literature macro economic volatility in emerging economies. Aguiar and Gopinath (2007) observe that shocks to trend growth—rather than transitory fluctuations around a stable trend—are the primary source of fluctuations in emerging markets. This observation is in line with the idea that slow-moving political factors are behind growth trends.[3] Koren and Tenreyro (2007) separate growth volatility on the country level from sector-specific volatility. They find that, as countries develop, their productive structure moves from more volatile to less volatile sectors and volatility of country-specific macroeconomic shocks falls. Our ideas are also related to the observation by Calvo (1998) that "sudden stops" in capital flows occur in countries because there is policy flexibility; local governments are more constrained in their policy choices creating less policy risk. This literature has not yet connected directly to that on changing political institutions and the impact on volatility.

There is also a large literature which links institutions to foreign direct investment. In the 1990s, most research on the influence of policy-related variables on FDI flows consisted of international cross-country studies. This found a negative link between institutional uncertainty and private investment (Brunetti and Weder, 1998), a positive relationship between FDI and intellectual property protection (Lee and Mansfield, 1996), and a negative impact of corruption on FDI flows (Wei, 2000). Kesternich and Schnitzer (2010) considers how political risk of different forms impacts the firms choice of capital structure. Using data on German multinationals, they find that greater risk, as measured by the International Country Risk Guide, tends to increase leverage. Such studies face the usual issue that most variation in the independent variables could reflect unobserved heterogeneity.[4]

One way to mitigate such concerns is to exploit only within-country variation. Using a panel data set on 55 developing countries for the period 1987-95, Harms (2002) estimated the impact of financial risk on equity investment flows (i.e., the sum of FDI and portfolio investment) and found that lower financial risk is associated with an increase in FDI and portfolio investment. Exploiting panel data for 73 countries between 1995 and 1999, Egger and Winner (2005), found evidence of a positive correlation between corruption and FDI. They argue that, with high levels of regulation and administrative controls, corruption may serve

[3] We adopt their economic framework but, for simplicity, model volatility as a period-to-period variance.

[4] Kesternich and Schnitzer (2010) alleviate this concern somewhat by making use of the observed variation between affiliates of the same parent which are located in different countries.

as a “helping hand” for FDI. Papaioannou (2009) uses data on inter-bank lending to show that financial flows increase when the political risk rating by the Political Risk Services (PRS) falls. This rating is a composite index that captures a broad set of factors including ethnic tensions, corruption, and the political, legal, and bureaucratic institutions of a country. He uses both a long panel for 50 recipient countries and a cross-sectional IV strategy to demonstrate the association between financial flows and the risk rating. His IV estimates suggest that a 10 point increase in institutional performance leads to a 60%-70% increase in inflows.

Several recent studies have analyzed the relationship between democratic rights and FDI. Using different econometric techniques and periods, Harms and Ursprung (2002), Jensen (2003), and Busse (2004) found that multinational corporations are more likely to be attracted to democracies. Li and Resnick (2003) argue that the location decision is influenced by political risk. Jensen (2008) looks at the link between political risk and FDI. He runs cross-country regressions for a sample 132 countries finding a negative correlation between FDI and measures of risk. Jensen also finds that the strength of executive constraints, in particular, is associated with lower political risk. A related literature looks at the impact of institutions on comparative advantage and, hence, trade flows.[5] In contrast to this literature, we focus on a specific institutional channel in which good policies raise aggregate productivity.

We make two main advances over prior work. First, we use a long panel of sector-level investments for a large number of countries which allows us to exploit rare changes in political institutions while controlling for a large set of country/sector fixed effects. Second, go beyond a reduced-form approach and explore a specific mechanism working through a reduction in aggregate volatility.

Finally, our work is related to work on the role of policy uncertainty for economic activity. Rodrik (1991) argues that even low levels of policy risk about the implementation of reforms can prevent inflow of foreign capital into developing markets. Baker, Bloom and Davis (2013) provide a measure of policy uncertainty using news reports. They find negative effects of uncertainty for firms heavily exposed to government contracts. In our paper, we posit that the absence of executive constraints may be a key driver of increased risk and suppose that investors might learn from the experience of other countries with the same institutional set-up.

The remainder of the paper is organized as follows. The next section discusses the data and reduced-form evidence. Section three specifies a model and focuses on two key parameters suggested by the theory. We then apply the model to explain the pattern of investment inflows among countries that adopted strong executive constraints over the period of our data. Section four offers some concluding comments.

2 Reduced-Form Evidence

In this section, we explore the relationship between political institutions and foreign investment using a reduced-form difference-in-difference approach. Specifically, we will ask how different configurations of

[5] See Nunn and Trefler (forthcoming) for a literature overview.

political institutions affect the way that foreign investment is allocated across countries exploiting within-country variation. We will use the findings from this exercise to motivate an approach based on a specific mechanism.

2.1 Data and Background Facts

Our main data set comes from *De Nederlandsche Bank* (DNB). The Central Bank provided us with quarterly, sector-level data from 1983 to 2010 for a sample of more than 200 territories, entities and countries. Since we are interested in the connection between foreign investment and political institutions, we merge this data with the Polity IV dataset on political institutions by country. Following this, we are left with yearly data on 154 countries between 1983 and 2010. We focus on gross positive investment inflows by multinationals to countries. Details on the definition of the investment variable and other data are in the Appendix. Since we have sector level data, we include country/sector fixed effects. And in order to avoid having too many zeros, we focus on the 12 largest sectors which account for more than 99 percent of all investment flows from the Netherlands over this period.[6]

We will focus on executive constraints as our core measure of political institutions. Much of the literature on political institutions and economic performance treats democracy as an aggregate outcome based on the index in Polity IV. We use a more disaggregated approach because from a theoretical perspective, we believe that there is a persuasive argument for why executive constraints matter for foreign direct investments; this is also the case empirically. Strong executive constraints are reasonably rare in the Polity IV data; only 20% of country year observations since 1950 have the highest score for executive constraints which is much smaller than the group of countries that regularly hold contested elections (around 50%).

Since our data comes from a single country, we are able to focus on variation in the characteristics of recipient countries. We do not, however, have any detailed account of how investment flows are used and whether, for example, they are leveraged locally. Our focus, therefore, differs from that of the FDI literature which studies vertical and horizontal patterns of FDI as an alternative to trade which requires more detailed firm-level data which we do not have. The main advantage of our data comes from the wide range of countries and the length of the time period which spans a number of institutional changes and hence allows us to exploit within-country variation.[7]

2.2 Empirical Specification

We use information on gross yearly investment flows from the Netherlands for the twelve largest sectors for the period 1983-2010. As a robustness check, we will run the same specifications with aggregate investment flows at the country level and use data on investment flows from the OECD. The latter ensures that our

[6] All our main results are robust to including all sectors.

[7] Coverage in the foreign direct investment dataset provided by the U.S. Bureau of Economic Analysis (BEA), for example, is much lower - it covers about 1/3 of the country years in our dataset. This also means that coverage is sparse. Hungary and Poland, the only countries in Eeastern Europe that appear in the BEA dataset receive their first flows in 1999.

results are not driven by any peculiarity in the behavior of Dutch multinationals. Let $\delta_{ct} \in \{S, W\}$ denote whether country c at time t has strong (S) or weak (W) executive constraints based on a Polity IV value of 7 to define strong constraints. From this we construct the indicator variable $\Omega(S) = 1$ and $\Omega(W) = 0$ denoting which political institution is in place.

Figure 1 provides a preliminary look at the relationship between strong executive constraints and investment. The graph shows mean investment flows for the sample of countries in the data for the 1983-2010 period whose executive constraints have not transitioned to strong constraints. It shows that countries with strong executive constraints benefitted much more from the wave of investment flows associated with globalization from the mid 1990s onwards. Thus, mean yearly flows from the Netherlands into countries with strong executive constraints were about 20 billion Euros towards the end of the 2000s compared with less than 2 billion in the sample with weak executive constraints. This relationship between investment and strong executive constraints is preserved even if we include controls for population, GDP per capita or the level of GDP.[8] While our regression analysis exploits only within-country variation, it is worth noting that having strong executive constraints at the beginning of the 1980s is a good predictor of investment inflows thereafter. But a sterner test will be to see whether countries that adopted strong executive constraints gain a dividend similar to that seen in the cross-sectional pattern.

Our core outcome variable is the gross investment inflow to a particular country c in a given year t. This is a non-negative variable which takes on positive values with a large number of zeros. Following recent work in trade literature, we will use a fixed-effects Pseudo Poisson regression model for investment flows.[9] Figure 1 shows that the overall level of global flows increased significantly over time. As countries also tended to switch into strong executive constraints over this period, it is important to identify the effect of this separately from the general time trend in investment flows. We address this issue by using total global flows as the exposure variable in our Pseudo Poisson model, making periods with different total flows comparable. Figure 2 is supportive of this approach; it uses the same sub-samples of countries as shown in Figure 1 but now gives the average share of global flows, as opposed to the average flows, attracted by countries with strong and weak executive constraints. The average *share* has remained remarkably stable suggesting that the share of the inflow is indeed comparable over time. Pseudo Poisson regression with total inflows as an exposure variable can also be thought of as modelling the annual *rate* of investment inflows into a country in each year.[10]

Following this approach, the core specification that we estimate for the sector-level data is

$$E\left\{x_{sct} : \alpha_{cs}, \delta_{ct}, y_{ct}, X_{st}\right\} = \exp\left(\alpha_{cs} + \gamma\Omega\left(\delta_{ct}\right) + \beta y_{ct} + \log X_{st}\right) \tag{1}$$

[8] The dramatic increase in FDI flows outpaced GDP growth significantly.

[9] See page 645 of Silva and Tenreyro (2006) who argue that gravity equations can be estimated with the Pseudo Poisson model (PML). We need country/sector fixed effects and therefore follow Wooldridge (1999) simply by using the vce(robust) option in the STATA xtpoisson command. For details, see the discussion on Timothy Simcoe's webpage.

[10] See Frome (1983) for a discussion of using the Poisson model to study rates. For a general discussion of count data models, see Cameron and Trivedi (2013).

where x_{sct} is the inflow of investment in sector s in country s in year t, α_{cs} is a country/sector fixed-effect, and y_{ct} denotes other controls that we include. The exposure variable here X_{st} is total investment flows in sector s in year t.

We will also look at specifications where we look at total investment inflows at the country level, i.e.

$$E\left\{\bar{x}_{ct} : \alpha_{cs}, \delta_{ct}, y_{ct}\right\} = \exp\left(\alpha_c + \gamma\Omega\left(\delta_{ct}\right) + \beta y_{ct} + \log X_t\right) \tag{2}$$

where $\bar{x}_{ct}$ is total investment in country c in year t and α_c is a country fixed-effect. The exposure variable X_t now captures total investment flows in year t.

2.3 Main Results

Table 1 shows the reduced-form correlations. In panel A we display results at the sector level and in panel B we display results at the country level. Reported standard errors are cluster-robust at the level of the panel variable, i.e. the country/sector in panel A and the country in panel B.

Column (1) presents the core reduced-form finding. The coefficient on strong executive constraints is consistent with an economically important effect in line with the cross-sectional variation in Figures 1 and 2. investment flows to a country increase by about 80 percent at the sector level and by about 68 percent at the country level when there are strong executive constraints in place. It is important to bear in mind that, through the choice of our exposure variable, we are looking at the rate of investment flows in a country/sector controlling for global flows in that sector. This implies that small and large sectors receive equal weight in Panel A. The similar magnitude of the coefficients in Panel B suggests that smaller and larger sectors react in similar ways to the adoption of strong executive constraints.

Column (2) shows that it is strong executive constraints rather than other measures of institutions that attract investment inflows. Unlike strong executive constraints, there is no significant correlation between high competitiveness and/or openness of executive recruitment and investment flows as measured by the PolityIV data. These are the other dimensions describing the executive that go into calculating country-level "democracy" scores.[11] This observation justifies our focus on executive constraints in what follows. The similarity between the sector-level and country total remains a feature of the results.

In column (3) we control for GDP per capita. The coefficient on strong executive constraints is unaffected.[12] Moreover, GDP per capita is not significantly correlated with investment inflows. Column (4) aggregates our data on investment and executive constraints to 5 year periods and then includes another important measure of the level of development, years of schooling, for which we use the Barro and Lee dataset. This counters the claim that strong executive constraints may simply be serving as a proxy for omitted

[11] For details see the Polity IV manual codebook. We also used a more flexible specification with regard to the cut-off on executive constraints. This reveals that quite clearly that it is the change from 6 to 7 which appears to be important for investment inflows. We discuss this in the following section.

[12] The finding is similar if instead, we include GDP and/or GDP per capita growth.

human capital.[13] The size of the coefficient on strong executive constraints even increases slightly in this specification. In both panels, the human capital variable is not itself significant in explaining investment inflows, principally because the variable is slow moving and we are including country fixed effects.

Taken together, the results in columns (2) through (4) suggest that the correlation between strong executive constraints and increased investment inflow does not seem to stem from the fact that executive constraints proxy for other political institutions or economic factors. And the findings hold up at both the sector-level and when we look at country averages.

Column (5) tries an alternative measure for investment inflows. This deals with the concern that the results are primarily driven by some large "outlier" values in some sectors/countries. In panel A, column (5), we measure investment inflow as a dummy variable that takes the value one if the investment inflows are strictly positive in a given country/sector/year. In Panel B, it is the number of sectors that have a positive inflow. The positive coefficient in both panels in column (5) is interesting since it indicates that the previous results were not driven by changes at the intensive margin alone (more flows in a given sector) but, also at the extensive margin (more sectors with inflows).

Finally, panel B column (6) looks at an alternative data source, using investment flows from *all* OECD countries. The main finding is robust and the size of the coefficient is strikingly similar to that found in column (1).

The identification of the effect of strong executive constraints in all specifications comes from variation within countries over time. To be credible, this requires that there be no common confounding factors driving both changes in institutions and investment. The fact that our estimates barely change when we add economic or political controls is re-assuring in this regard. An additional way to look for cofounding factors is to investigate the pattern of flows before and after an institutional change checking for pre-trends and post-trends in the data. To this end, Figure 3 illustrates the dynamic consequences for investment of adopting strong executive constraints. The graph reports the results of a regression of investment flows on the strong constraints dummy and the adoption year dummy with 4 leads and lags.[14] The graph demonstrates two main things. First, there is no positive pre-trend in the four years before strong executive constraints are adopted. If anything, the share falls slightly before the adoption date. Second, the effect of adopting strong executive constraints is discrete albeit with a one year lag. Thus, investment inflows respond quickly one year after the change and appear to stay at this higher level thereafter. The theoretical model developed below predicts a level effect on investment of precisely this kind.

2.4 Additional Results and Robustness

Given that we have sector level data it is interesting to check whether different sectors are affected differently by the adoption of strong executive constraints. To this end we run a regression as in equation (1) but now add interaction terms between the executive constraints dummy, $\Omega(\delta_{ct})$, and our twelve sector dummies.

[13] See the discussion in Glaeser et al (2007).

[14] See Table A1. Figure 3 uses results in column (2). Figure A2 shows the same graph for OECD investment inflows.

The coefficients and their 95% confidence intervals are reported in Figure 4. It is clear from this figure that the results in the previous table are not driven by particular sectors but are fairly evenly spread across sectors. All coefficients are estimated to be positive and none are statistically different from each other.

Table 2 explores the robustness of the findings further and also presents some alternative specifications. In parallel with Table 1, it presents results for both sector-level in Panel A and country-level investment flows in Panel B.

In column (1), we include the ICRG measure of property rights protection which is frequently used to capture the consequences of institutions. This variable is available for a shorter time period than our main data. However, it does represent the kind of risk that foreign investors may care about. The result in column (1) suggests that stronger property rights protection does indeed have a positive association with investment inflows. However, including this variable does not change the core finding that there is a significant positive correlation between investment and strong executive constraints. So the ICRG variable seems not to be catch-all for *all* formal institutional changes in this context. In fact, with its inclusion, the coefficient on strong executive constraints barely changes from column (1) of Table 1.

In column (2) we exclude observations before 1992 as several countries enter the sample in 1991 so the composition of countries changes. This period, in particular, saw the opening up of the countries of the Eastern block some of which became popular destinations for Western investment. The results are robust to restricting to this time period.

We then look at three alternative ways of capturing the changing global pattern of investment flows in this period. In column (3), we add year dummy variables instead of the exposure option with global flows. This is a less parametric option for capturing the changing global environment for investment. In column (4) we use positive net inflows instead of gross inflows as our dependant variable. Results are robust to this. Finally, column (5), uses the *share* of the investment flow that goes to country c in year t as the dependent variable. This is another way of controlling for the changing pattern of global investment flows. The positive correlation with strong executive constraints is robust to both of these specifications.

3 Exploring a Mechanism

The reduced-form results suggest a robust association between having strong executive constraints and investment inflows exploiting only within-country variation. Countries with strong constraints appear significantly more likely to attract investment and these results are robust to a variety of approaches and controls. But, as with any reduced form estimates, the results offer little clue about *why* this is the case.

Before we move into the theoretical discussion it is useful to review the meaning of strong executive constraints as measured in the data. The checklist for coders in the Polity IV manual states that the highest score of the variable "xconst" is only allocated if most important legislation is initiated by a parliament which holds the executive to account. Our reading of the country reports is that those coding countries pay a lot of attention to whether the executive relied on support from another organization (this could be, parliament, independent courts or the military) to conduct policy.

In this section, we develop a theoretical approach which is based on Besley and Mueller (2014) and captures these institutional constraints. In this model politics influences trend productivity growth and the variance of productivity shocks around that trend. We use this approach to suggest a more structured approach to the data where we consider whether predicted changes in the profile of productivity following the adoption of strong executive constraints is associated with investment inflows.

3.1 Theory

We begin by developing an economic model with investment by foreign and domestic firms in a world of stochastic productivity which is affected by government policy. We then develop a simple model of politics which shows how executive constraints can affect the mean and variance of shocks to productivity growth.

3.1.1 Economics

Consider an open economy with a fixed number of sectors indexed by i and where π_i be the number of firms in sector i. We study the behavior of a representative firm in each sector. A sector's labor productivity has a time-invariant firm-specific component, ρ_i, and a time-varying country-specific component, Γ_t. The latter is assumed to depend on country-level economic policies along the lines articulated by Aghion and Howitt (2006) and evolves stochastically over time according to

$$\Gamma_t = \Gamma_{t-1} e^{p_t}$$

where $p_t = \kappa + \varepsilon_t$ with the stochastic time-varying shock to productivity growth being normally distributed, i.e. $\varepsilon_t \sim N\left(-\frac{\sigma_\varepsilon^2}{2}, \sigma_\varepsilon\right)$.[15] In the next subsection, we present a model of the political process in which κ and σ_ε depend on whether a country has weak or strong executive constraints.

Output in the representative firm in sector i is given by the following Cobb-Douglas production function:

$$Y_{it} = \left[\left(\Gamma_t \rho_i L_{it} \right)^{\alpha} K_{it}^{1-\alpha} \right]^{\eta}$$

where $\eta < 1$. This is a Lucas (1978) "span of control" model of firm level heterogeneity where pure profit is a return to owning a specific technology.

Firms hire capital and labor in competitive factor markets. However, we assume a difference in timing between labor and capital decisions. Capital is installed before ε_t is realized while labor is chosen afterwards.[16] The labor market is closed with a fixed stock of labor L. The capital market is open with inflows of capital into foreign owned firms representing investment and the global cost of capital is r.[17]

[15] This implies that $E\left(e^{\varepsilon_t}\right) = 1$.

[16] This is a key assumption and is tantamount to assuming that ex post adjustment costs are very high. Risk would not matter in our framework if capital could be chosen flexibly and costlessly adjusted after ε_t becomes known.

[17] This theoretical approach could be applied to domestic and foreign owned firms alike. For foreign owned firms, the assumption that r is exogenous is, however, more plausible. It would be straightforward, although tedious, to separately model the domestic and foreign-owned sectors of the economy.

A firm in sector i chooses labor demand, L_{it}, to maximize

$$\left[(\Gamma_t \rho_i L_{it})^{\alpha} K_{it}^{1-\alpha}\right]^{\eta} - wL_{it}.$$

We can use the resulting labor demand functions to solve for the equilibrium wage. Substituting this back and summing we have that aggregate output is

$$Y_t = [\Gamma_t L]^{\alpha\eta} \left(\hat{K}_t\right)$$

where

$$\hat{K}_t = \left(\sum \pi_i \rho_i^{\frac{\alpha\eta}{1-\alpha\eta}} K_{it}^{\frac{[1-\alpha]\eta}{1-\alpha\eta}}\right)^{1-\alpha\eta}$$

is a productivity weighted average of the capital stock by all sectors in the economy.[18] The profit function of a representative firm in sector i is therefore:

$$\Pi\left(\rho_i, \Gamma_t, K_{it} : \hat{K}_t\right) = (1-\alpha\eta)\, \rho_i^{\frac{\alpha\eta}{1-\eta\alpha}} K_{it}^{\frac{[1-\alpha]\eta}{1-\eta\alpha}} \, [\Gamma_t L]^{\alpha\eta} \left[\hat{K}_t\right]^{-\frac{\alpha\eta}{1-\eta\alpha}}.$$

Since aggregate capital affects the wage it also affects the incentive of any firm to invest. We assume a rational expectations competitive equilibrium where firms maximize profits taking aggregate capital $\hat{K}_t$ as given. This assumes firms act as if they can affect the aggregate level of capital in the economy. We then solve for a fixed point to obtain an expression for aggregate output.

Using this approach, K_{it} maximizes

$$E\left[\Pi\left(\rho_i, \Gamma_t, K_{it} : \hat{K}_t\right)\right] - rK_{it}$$

with expectations taken with respect to ε_t which is unknown when capital is installed. We show in the appendix that this yields the following expression for per capita output which depends only on exogenous variables:

$$y_t = B \times [\Gamma_t]^{\alpha\eta} \left[E[(\Gamma_t)^{\alpha\eta}]\right]^{\frac{(1-\alpha\eta)(1-\alpha)\eta}{1-\eta+\alpha(1-\alpha)\eta^2}} \tag{3}$$

where B is a time-invariant constant. The level of output now depends on the realized period t productivity shock and the ex ante mean and variance of productivity shocks since these affect the incentive to invest. Since we have assumed that the productivity shocks caused by the political environment are exogenous, equation (3) allows us to separate the direct effect of productivity shocks working through $[\Gamma_t]^{\alpha\eta}$ from the indirect effect of inhibited capital accumulation working through $E[(\Gamma_t)^{\alpha\eta}]$.

[18] More steps in the derivations are available in the Appendix.

3.1.2 Politics

We now consider how κ and σ_{ε}^2 depend on whether a country has strong or weak executive constraints using a stripped down model of politics.[19] The role of executive constraints is to curtail some instances of bad policy making in the spirit of the veto players model of Tsebelis (2002). We will think of this as achieved through the actions of a legislature which can reduce the discretion of the executive.

As above, let $\delta_{ct} \in \{W, S\}$ denote whether a country has strong or weak executive constraints at date t. With weak executive constraints, policy is determined solely by the executive while with strong executive constraints a legislature also influences policy as outlined below.

To map politics directly onto our economic model above, suppose that p_t depends on policy making represented by a parameter Δ_t which varies stochastically depending of the behavior of policy-makers. While we do not model the micro-foundations of policy making, we have in mind a range of policies that could drive growth along the lines of Aghion and Howitt (2006). The expected productivity growth trend is now

$$\kappa(\delta) = E[\Delta_t : \delta]$$

with $p_t = \kappa(\delta) + \varepsilon_t$ where $\varepsilon_t = [\Delta_t - \kappa(\delta) + \omega_t]$ and ω_t is an *iid* shock with mean $-\frac{\sigma_{\varepsilon}^2(\delta)}{2}$ and variance σ_{ω}^2. The variance of productivity around its trend is:

$$\sigma_{\varepsilon}^2(\delta) = var(\Delta_t : \delta) + \sigma_{\omega}^2.$$

Thus political institutions affect productivity growth through the mean and variance of Δ_t. We now suggest a simple micro foundation for why executive constraints influence policies Δ_t.

No Executive Constraints ($\delta = W$): In this case, executive competence alone determines productivity growth. We suppose that $\Delta_t \in \{\Delta_L, \Delta_H\}$ with $\Delta_H > \Delta_L$ The probability of Δ_H depends on the competence of the executive with λ denoting the probability that the executive is competent. Then:

$$\kappa(W) = \lambda\Delta_H + (1-\lambda)\Delta_L$$

and

$$\sigma_{\varepsilon}^2(W) = \lambda(1-\lambda)[\Delta_H - \Delta_L]^2 + \sigma_{\omega}^2.$$

In this case, it is λ, the competence of the executive, which affects both $\kappa(W)$ and $\sigma_{\varepsilon}^2(W)$ directly. Greater competence increases the trend rate of productivity growth but has an ambiguous effect on its variance.

[19] The theoretical approach is further developed in Besley and Mueller (2014). It is based on ideas in the political agency literature first developed in Barro (1973) and Ferejohn (1986). Besley (2006) offers a review of the main ideas.

Executive Constraints ($\delta = S$)**:** Here we suppose, following coding practice in the data, that a legislature also has a say in making policy. Specifically, they can veto any proposal by the executive and impose a policy which yields $\Delta_0 \in [\Delta_L, \Delta_H]$. One interpretation of this is as maintaining a status quo rather than allowing policy activism.[20] The key assumption is that this is a moderating influence since the payoff of this policy lies between the bad and good outcomes achieved under pure executive discretion.

We model the imposition of this default outcome in a reduced-form way, supposing that Δ_0 is imposed with probability ϕ_J $(J \in \{L, H\})$ when the executive would have generated growth of Δ_J. If $\phi_H > 0$, the constraint results in discretion sometimes being removed even when the outcome would have been Δ_H. However, if $\phi_L < 1$, the legislature can prevent a policy error that would have resulted in a payoff of Δ_L. Thus the pair $\{\phi_H, \phi_L\}$ represent the competence of the legislature.

Now define:

$$\tilde{\Delta}_J = [(1 - \phi_J)\,\Delta_J + \phi_J \Delta_0]\,.$$

Using this, the key model parameters determining productivity growth are:

$$\begin{aligned} \kappa(S) &= \lambda \tilde{\Delta}_H + (1 - \lambda)\,\tilde{\Delta}_L \\ &\text{and} \\ \sigma_\varepsilon^2(W) &= \lambda(1 - \lambda)\left[\tilde{\Delta}_H - \tilde{\Delta}_L\right]^2 + \sigma_\omega^2. \end{aligned}$$

Comparing this to the case without executive constraints, these parameters now depend not only on the competence of the executive, λ, but also the competence of the legislature $\{\phi_H, \phi_L\}$ and the quality of the default policy Δ_0.[21]

3.1.3 Empirical Implications

We now develop two implications of the theory which are crucial to developing an empirical application. The first is a prediction about productivity growth across political regimes and the second concerns the impact on investment.

For productivity growth and volatility we have:

Proposition 1 *Trend productivity growth may be higher or lower with strong executive constraints, i.e.*

$$\kappa(S) \gtrless \kappa(W) \text{ as } \lambda \phi_H [\Delta_H - \Delta_0] + (1 - \lambda)\,\phi_L [\Delta_L - \Delta_0] \gtrless 0$$

The variance of the productivity shocks ε_t is unambiguously lower under strong executive constraints, i.e.$\sigma_\varepsilon^2(S) < \sigma_\varepsilon^2(W)$.

The mean effect depends on whether the constraints predominantly allow good executive discretion and

[20] This in the spirit of Tsebelis (2002) who argues that having more veto players increases status quo bias in political systems.

[21] In Besley and Mueller (2014), λ is derived as an endogenous variable and also varies with executive constraints.

eliminate bad use of discretionary policy. However, the reduction in the variance holds regardless of this as long as the default policy induces moderation, i.e. $\Delta_0 \in [\Delta_L, \Delta_H]$. If executive constraints always impose the default $\phi_H = \phi_L = 1$ then productivity growth $\kappa(S) = \Delta_0$ always and the model features no volatility due to policy. The model has, as another special case, a perfectionist view of executive constraints in which $\phi_H = 0$ and $\phi_L = 1$. In this case the outcome Δ_L is replaced by Δ_0 under strong executive constraints.[22]

We now use this comparison to derive implications for investment with and without executive constraints. The optimal capital stock, and hence investment, at the firm level depend on the expected productivity growth and its volatility. Investors should therefore react to changes in these. Following the evidence above, we are interested in understanding the implications for foreign owned firms and hence investment. But if we had good country level firm or sector specific data on firms, this too could be used. This underlines the benefit of having accurate data on investment at the sector-level for a large number of countries. We will now state the empirical prediction specifically to emphasize the link to the data.

We show in the appendix that the optimal capital stock for firm i is given by

$$\begin{aligned}
\ln K_{it}^*(\delta) &= \ln C_i - \frac{(1-\alpha\eta)\,\alpha\eta\,(1-\eta)}{2\left(1-\eta+(1-\alpha)\,\alpha\eta^2\right)}\sigma_\varepsilon^2(\delta) \\
&\quad + \frac{\alpha\eta\,(1-\eta)}{1-\eta+(1-\alpha)\,\alpha\eta^2}\kappa(\delta) + \ln\left((\Gamma_{t-1})^{\alpha\eta}\right)^{\frac{1-\eta}{1-\eta+[1-\alpha]\alpha\eta^2}}
\end{aligned} \tag{4}$$

where C_i is a sector-specific constant. Equation (4) shows that investment incentives follow the deep parameters of the productivity growth process. In this way changes in the political institutions $\delta_t \in \{W, S\}$ have a direct implication for investments given by:

Proposition 2 *The optimal capital stock of foreign firms is increasing in $\kappa(\delta)$ and decreasing in $\sigma_\varepsilon^2(\delta)$.*

Thus, the model predicts that investment will respond to changes in $\left\{\kappa(\delta), \sigma_\varepsilon^2(\delta)\right\}$. This gives an immediate link to the reduced-form findings above where we found that inflows of investment were higher under strong executive constraints. However, since Proposition 1 shows that $\kappa(\delta)$ can increase or decrease under strong executive constraints, the overall prediction for investment from the adoption of executive constraints using the theoretical model is ambiguous.[23]

Proposition 2 motivates trying to decompose the outcome into an effect coming through both $\kappa(\delta)$ and $\sigma_\varepsilon^2(\delta)$. To that end, we will first estimate $\kappa(\delta)$ and $\sigma_\varepsilon^2(\delta)$ from aggregate growth data. We show in the Appendix, that mean growth, $\mu_g(\delta)$, and the variance of growth $\sigma_g^2(\delta)$ can be used to derive estimates of

[22] The key assumption that drives the comparison of the variances is that $\Delta_0 \geq \Delta_L$, i.e. that the legislature can never makes things worse by vetoing what the executive does.

[23] The model does not predict any sector level heterogeneity in the effect of aggregate productivity shocks on $\ln K_{it}^*$. We test this prediction below.

the productivity parameters $\left\{\hat{\kappa}(\delta), \hat{\sigma}_{\varepsilon}^{2}(\delta)\right\}$ from:

$$\hat{\kappa}(\delta) = \frac{1-\eta+\alpha\eta}{\alpha\eta}\hat{\mu}_{g}(\delta) + \frac{1-\alpha\eta^{2}+\alpha^{2}\eta^{2}}{2(\alpha\eta)^{2}}\hat{\sigma}_{g}^{2}(\delta) \tag{5}$$

and

$$\hat{\sigma}_{\varepsilon}^{2}(\delta) = \left(\frac{\hat{\sigma}_{g}(\delta)}{\alpha\eta}\right)^{2}. \tag{6}$$

In the following section we will use the estimated parameters $\left\{\hat{\kappa}(\delta), \hat{\sigma}_{\varepsilon}^{2}(\delta)\right\}$ from equations (5) and (6) to explain investment inflows motivated by (4). This will allow us to decompose the effect of adopting strong executive constraints into an effect operating through a change in trend growth and a change in the variance of productivity shocks. In line with Proposition 1, we will see whether the variance reduction can explain the reduced form finding in the previous section.

3.2 Evidence

We will first show that executive constraints do indeed affect the mean and variance of growth in line with our political model. We then use equations (5) and (6) to construct empirical measures of expected productivity in different political regimes, $\left\{\hat{\kappa}(\delta), \hat{\sigma}_{\varepsilon}^{2}(\delta)\right\}$.

As a final step we estimate a model of investment in which $\hat{\kappa}(\delta)$ and $\hat{\sigma}_{\varepsilon}^{2}(\delta)$ drive investment decisions. This allows us to explore heterogeneous responses to institutional change via the mechanism suggested by Proposition 2.

3.2.1 Executive Constraints and Growth

There are strong empirical regularities in the relationship between growth and executive constraints. The core facts are illustrated in Table 3, panel A which gives some summary statistics for real GDP per capita growth from the Penn World Tables differentiated according to whether a country has strong or weak executive constraints. The first part of the table summarizes the raw data for the full sample of countries between 1970 and 2010. The sample of country/year observations with strong executive constraints grew by 2.2 percent on average while the sample with weak executive constraints grew by 1.9 percent on average. This difference in average growth between the two groups is negligible and is not statistically significant. There is, however, a large difference in the second moments between the two groups. The variance of growth is roughly 3.5 times higher in the sample of countries with weak executive constraints and the difference is statistically significant at 5%.[24] This observation is consistent with the prediction in Proposition 1.

The second part of Table 3, panel A shows that this difference across regimes based on variation in political institutions is not driven purely by cross-sectional differences in growth. This observation is important in light of the well-known fact that poorer countries, which tend to have weak executive constraints, also

[24] The F statistics of the test in the full sample is F = 3.8.

have more volatile growth rates.[25] If we restrict the sample to those countries that spent at least five years in both strong and weak executive constraints between 1970 and 2010, the same basic picture emerges of a similar level of growth along with lower variance when strong executive constraints are introduced.

The evidence in Table 3 suggests that a change from strong to weak executive constraints induces a mean preserving spread in growth rates. Figure 5 confirms this visually by plotting Kernel densities for growth rates under strong and weak executive constraints. The distribution of growth rates is approximately normal. The more extreme outcomes (high and low) under weak executive constraints are clearly visible. The share of country/year observations with a negative growth rate under weak executive constraints is 32 percent but only 22 percent under strong executive constraints despite very similar average growth rates.

Prima facie, this finding gives credence to the idea that we might explain the reduced-form finding above as being due to a reduction in risk as measured by the volatility of productivity growth. Under the assumption that investors understand this relationship, we should expect an effect on investment from lower volatility. Equations (5) and (6) allow us to move from the mean and variance of growth to the parameters which affect investment according to the theory. To illustrate we use these equations and the growth summary statistics in Table 3, panel A to produce estimates of $\left\{\hat{\kappa}\left(\delta\right), \hat{\sigma}_{\varepsilon}^{2}\left(\delta\right)\right\}$ in Panel B. We need to postulate values of α and η for this purpose and we set them $\alpha = \frac{2}{3}$ with $\eta = \frac{3}{4}$.[26] Unsurprisingly, in light of (6), our observation on the variance of growth maps into a prediction about $\hat{\sigma}_{\varepsilon}^{2}\left(\delta\right)$. The variance under weak executive constraints is about four times higher than the variance under strong executive constraints.

3.2.2 Updating

According to our theory, investment is affected by expectations about the key parameters: $\left\{\hat{\kappa}\left(\delta\right), \hat{\sigma}_{\varepsilon}^{2}\left(\delta\right)\right\}$. We would expect such expectations to be informed by country-specific as well as world experiences of growth under strong and weak constraints.[27] If a country has never been in strong executive constraints, then we need to decide what is a reasonable expectation about the change in $\kappa\left(\delta\right)$ and $\sigma_{\varepsilon}^{2}\left(\delta\right)$ that takes place. This could simple be based on past global experience or it could take into account the experience of the country in question. So, for example, after five years in strong executive constraints, it seems reasonable to think that the country's own growth experience will become salient to investors rather than just the average experience of all countries in the world.

We approach this issue by building a Bayesian model of expectations formation for beliefs about trend productivity growth and its variance across political regimes. We show that this leads naturally to a "treatment effect" from strong executive constraints which is heterogenous with respect to the timing and a country's experience. This seems natural. For example, the East Asian crisis of the mid-1990s is in our time period and countries which made a transition before or after that would surely have taken that experience into account when assessing volatility. Moreover, some countries may have experienced greater

[25] See, for example, Koren and Tenreryo (2007).

[26] Changing these assumptions in a reasonable interval does not change our results much.

[27] This idea is similar in spirit to Buera et al (2011) which studies the diffusion of policy across nations as a learning process.

reductions in growth volatility depending on their starting point.

Our model is a standard Bayesian learning model with normally distributed shocks. It provides a natural framework to construct the *expected* trend productivity growth and variance as a function of the political regime, $\{\hat{\kappa}_{ct}(\delta), \hat{\sigma}_{\varepsilon ct}(\delta)\}$. The procedure we propose has two steps. First, we use standard formulae to model evolving expectations of $\hat{\sigma}_g^2(\delta)$ and $\hat{\mu}_g(\delta)$. These are updated over time in the light of new data realizations. Second, we use these estimates to calculate the parameters of productivity growth using (5) and (6).

Applying Bayesian Updating to Growth Data Consider a sample of countries which move between weak to strong executive constraints in the period for which we have investment data, i.e. 1983-2010. For countries that adopt strong (or weak) executive constraints for the first time, we suppose that investors use the growth experiences of *other* countries that have had strong executive constraints to form their prior. Specifically, we allow the prior belief to be based on observations for *all* countries between 1970 and the date at which the transition to strong executive constraints takes place in country c. For the subsequent updating, we consider two possibilities:

Worldwide updating: Here we suppose that investors continue to use information on all countries as they update their estimate of the mean and variance of growth. This approach limits the extent to which the effect of institutional transitions is heterogeneous by country.

The regressors that we include to represent the expected mean and variance in this case are:

$$\widehat{mn}_{ct} = \Omega(\delta_{ct})\, \hat{\mu}_g(S,t) + [1 - \Omega(\delta_{ct})]\, \hat{\mu}_g(W,t) \tag{7}$$

and

$$\widehat{var}_{ct} = \Omega(\delta_{ct})\, \hat{\sigma}_g^2(S,t) + [1 - \Omega(\delta_{ct})]\, \hat{\sigma}_g^2(W,t) \tag{8}$$

where $\hat{\sigma}_g^2(\delta,t)$ is the sample variance of growth in regime δ for all countries between 1970 and time t and $\hat{\mu}_g(\delta,t)$ is the sample mean growth in regime δ for all countries between 1970 and time t.[28] Variation in $\{\widehat{mn}_{ct}, \widehat{var}_{ct}\}$ across countries, in this case, comes purely from them having different transition dates.

Using this measure, a change from $\delta_{ct} = W$ to $\delta_{ct} = S$ reduces the expected variance of growth, $\widehat{var}_{ct}$, (on average) from 0.029 to 0.007, i.e. by about 0.022. The mean and variance are updated annually in response to the world-wide experience of growth in different institutional regimes. The late 1990s saw a significant increase in the growth volatility in countries with weak executive constraints, $\hat{\sigma}_g^2(W,t)$, due to the East Asian crisis followed by a later decline.[29]

[28] The formula ignores that $\sigma_t^2(\delta)$ and $\mu_t(\delta)$ are constructed from a finite sample. Given the size of almost 2000 observations this has very little effect.

[29] Appendix Figure A3 shows how the beliefs about the standard deviation of GDP growth changed over time in the two regimes.

Country-specific updating: We now allow the mean and variance to be updated based on a particular country's growth experience when it adopts strong executive constraints. To explain this, suppose that a country has a single transition in our data period.[30] When country c transitions we proceed as above, basing the prior for the new regime on all countries in the world from 1970 onwards. Specifically, we use growth data between 1970 and time t from all countries to construct the following data moments:

$$G^1(\delta, t) = \hat{\mu}_g(\delta, t) \text{ and } G^2(\delta, t) = \hat{\sigma}_g^2(\delta, t) + \hat{\mu}_g^2(\delta, t).$$

When a country transitions, the issue of arises of how much weight (D) to assign to the history of other countries, i.e. how much weight to give to $G^1(\delta, t)$ and $G^2(\delta, t)$. In general, we can write the updated country-specific mean of growth as

$$\hat{\mu}_{gct}(\delta, \tau(c) + D) = \frac{D \times G^1(\tau(c), \delta) + \sum_{s=1}^{t} g_{cs}(\delta)}{D + t}$$

where t is the time that a country is in a regime $\delta = S, W$ and $\tau(c)$ is the year in which the country transitioned into this regime. In general the estimate of mean growth at $t > \tau(c)$ is a weighted average between $G^1(\tau(c), \delta)$ and $\sum_{s=1}^{t} g_{cs}(\delta)$. A higher value of D means that more weight is given to the growth history of other countries with the same institutions. Analogously we have

$$\hat{\sigma}_{gct}^2(\delta, \tau(c) + D) = \frac{(D+t) \times \left[D \times G^2(\tau(c), \delta) + \sum_{s=1}^{t} [g_{cs}(\delta)]^2\right] - \left[D \times G^1(\tau(c), \delta) + \sum_{s=1}^{t} g_{cs}(\delta)\right]^2}{(D + t - 1)(D + t)}$$

using the standard formula for updating the sample variance of a normally distributed variable.[31]

We will vary the weight placed on the initial value compared to the country-specific, post-transition history and consider three cases: $D = 2$, $D = 10$, $D = 100$ and $D = 1000$. For $D = 1000$, the country's growth history under the new regime receives almost no weight. At the other extreme where $D = 2$, the growth experience in other countries receives little weight. By experimenting with different weights, we will assess the sensitivity of our findings.

To construct the predicted mean and variance as a function of institutions, we now use:

$$\widehat{mn}_{ct} = \Omega(\delta_{ct}) \hat{\mu}_{gct}(S, t) + [1 - \Omega(\delta_{ct})] \hat{\mu}_{gct}(W, t) \tag{9}$$

[30] The same basic approach can be used to form in expectations when there are multiple institutional transitions. In such cases, we assume investors recall what happened previously in a particular institutional regime. Our results are all robust whether or not we include countries with multiple transitions.

[31] So see this set $D = 0$ which gives the standard sample variance formula $\hat{\sigma}_{ct}^2(\delta, 0) = \frac{t \times \sum_{s=1}^{t} g_{cs}^2(\delta) - \left[\sum_{s=1}^{t} g_{cs}(\delta)\right]^2}{(t-1)t}$.

and

$$\widehat{var}_{ct} = \Omega\left(\delta_{ct}\right)\hat{\sigma}^2_{gct}\left(S,t\right) + \left[1-\Omega\left(\delta_{ct}\right)\right]\hat{\sigma}^2_{gct}\left(W,t\right) \tag{10}$$

where the estimates of $\left\{\hat{\mu}_{gct}\left(\delta,t\right), \hat{\sigma}^2_{gct}\left(\delta,t\right)\right\}$ are now country-specific. This model of expectations formation is in effect allowing for a heterogeneous effect on investment of an institutional transition based on the regime-specific growth history for all countries as well incorporating heterogeneity through learning from a country's growth experience in a regime. The Bayesian learning framework imposes a specific form of heterogeneity. However, by varying D, we can give different weights to the two elements that go into the calculation of the expected mean and standard deviation of growth.

Trend Productivity Growth and Its Variance Whether we use worldwide or country-specific estimates of the mean and variance of growth, we can calculate

$$\begin{aligned}
\hat{\kappa}_{ct} &= \frac{1-\eta+\alpha\eta}{\alpha\eta}\widehat{mn}_{ct} + \frac{1-\alpha\eta^2+\alpha^2\eta^2}{2\left(\alpha\eta\right)^2}\widehat{var}_{ct} \\
\hat{\sigma}^2_{\varepsilon ct} &= \frac{\widehat{var}_{ct}}{\left(\alpha\eta\right)^2}
\end{aligned}$$

Figure 6 provides a first impression of what the data say using country-specific updating. The figure shows the mean estimate of $\hat{\sigma}_{\varepsilon ct}$ for $\delta = W$ in red and $\delta = S$ in blue and contrasts this with the mean global share of inflows in the two episodes. Figure 6 illustrates clearly that strong executive constraints reduces the estimated variance for most countries.[32] The general move in a north-westerly direction is clearly visible in this Figure. The heterogeneity in country experiences is also apparent. The countries in the sample are quite diverse including, for example, Poland, South Africa, Turkey and Argentina. In addition, several countries, like Argentina, move from high executive constraints to low executive constraints. We discuss robustness with regard to the sample below.

The Relationship to Political risk One useful way to validate our measures of trend productivity growth and its variance is to see whether they are related to political risk measures produced by the insurance industry which assists multinationals in reducing their exposure to political risk by allowing them to purchase insurance. The providers of this political risk insurance include private market participants, including Sovereign, Zurich, Chubb, Lloyd's of London, Aon, AIG, and government agencies such as the U.S. Governments' Overseas Private Investment Corporation (OPIC) or the Belgian insurer Delcredere Ducroire (ONDD). All of these organizations offer political risk insurance for multinational investors. This insurance is distinct from other types of property insurance; these contracts are designed to insure against specific political events. The political risk insurance industry categorizes these political risks into three broad categories: (1) war and political violence, (2) expropriation/breach of contract, and (3) transfer risk.

[32] We exclude the Lebanon from Figure 6 and our subsequent calculations. Appendix Figure A4 makes clear that the weak executive constraints episode in the country is an extreme outlier.

We collected data on political risk evaluations from ONDD who, according to their annual report, insured transactions worth about 7 billion EUR in 2011. The variable we use measures the risk of a credit default for reasons beyond the control of the debtor, i.e. due to political or financial macroeconomic events. We choose this variable because it provides the most consistent time-series. ONDD measures both short- and mid-term risk on a scale from 1 (low risk) to 7 (high risk).[33]

Table 4 explores the association between political risk as measured by the ONDD and our two constructed measures. In order to identify the effect of political risk, we exploit changes in the executive constraints regime δ and control for country fixed-effects in all regressions.[34] Both $\hat{\sigma}^2_{\varepsilon ct}$ and $\hat{\kappa}_{ct}$ are correlated with political risk as measured by the ONDD. Consistent with our theory, higher values of $\hat{\sigma}^2_{\varepsilon ct}$ are associated with higher political risk as assessed by insurers. This is true regardless of whether we use the model with worldwide updating or with country-specific updating. Moreover, the results are robust to all the values of D that we tried.

Table 4 reports coefficients which are normalized by the standard deviation. Thus, the coefficient in Table 4, column (2) implies that a one standard deviation increase in $\hat{\sigma}^2_{\varepsilon ct}$ is associated with a 1 point increase in short term risk as measured by ONDD (about half a standard deviation). Note that the association between our measure of volatility and the ONDD risk measure weakens somewhat as D is lowered.

Higher expected trend productivity growth, $\hat{\kappa}_{ct}$, is associated with lower risk and at a similar magnitude. There are many reasons beyond the theory why this might be the case. For example, credit default risk may lower with higher productivity growth. In terms of the theory presented in section (3.1.2) this suggests that political risk evaluations could be correlated with λ, the competence of the executive.

3.2.3 Empirical Approach and Results

We now run the following regressions where instead of including strong executive constraints directly, we use our estimates of trend productivity growth and the variance of productivity as a conduit for such constraints to affect outcomes. The sector-level specification is:

$$E\left\{x_{sct} : \alpha_{cs}, \hat{\sigma}^2_{\varepsilon ct}, \hat{\kappa}_{ct}, y_{ct}\right\} = \exp\left(\alpha_{cs} + \gamma_1\left(\hat{\sigma}^2_{\varepsilon ct}\right) + \gamma_2\left(\hat{\kappa}_{ct}\right) + \log X_{st}\right) \tag{11}$$

where x_{sct} is the inflow of investment in sector s in country c in year t. We will also look at specifications where we use the total flow at the country level, i.e.

$$E\left\{\bar{x}_{ct} : \alpha_{cs}, \hat{\sigma}^2_{\varepsilon ct}, \hat{\kappa}_{ct}, y_{ct}\right\} = \exp\left(\alpha_{c} + \gamma_1\left(\hat{\sigma}^2_{\varepsilon ct}\right) + \gamma_2\left(\hat{\kappa}_{ct}\right) + \log X_{t}\right) \tag{12}$$

[33] We use their "short-term" risk measure. Results are similar to using the "mid-term" risk measure instead.

[34] In Appendix Table A2 we show that there is a link between executive constraints, the risk rankings provided by ONDD and the protection of property rights from the International Country Risk Guide (ICRG). On average, countries with strong executive constraints have an ONDD risk ranking which is 2 points (about one standard deviation) lower than countries with low executive constraints.

where $\bar{x}_{ct}$ is the inflow of investment in country c in year t. As before we use the exposure model which controls for global investment flows. In both of these specifications, we expect $\gamma_1 < 0$ and $\gamma_2 > 0$.

In Table 5, column (1) we run a regression in which we use the time-varying estimates of the relevant variance and mean from the model with worldwide updating. Panel A shows results for the sector level and panel B shows results for the country level. All variables in Table 5 are normalized by their standard deviation.

The results in column (1) of Table 5 indicates that an increase of the variance by one standard deviation reduces investment flows by 34 percent. Among the countries that switched we have, on average, $\hat{\sigma}^2_{\varepsilon ct}(W) - \hat{\sigma}^2_{\varepsilon ct}(S) = 0.02$ which is by about two standard deviations.[35] Thus, the adoption of strong executive constraints would have boosted investment inflows by over 60 percent by changing investor's expectations from $\hat{\sigma}^2_{\varepsilon ct}(W)$ to $\hat{\sigma}^2_{\varepsilon ct}(S)$.

In columns (2) to (5) we look at four versions of country-specific updating. Column (2) reports results when we put a lot of weight on the previous worldwide experience ($D = 1000$). We reduce this weight to $D = 100$ in column (3), $D = 10$ in column (4) and $D = 2$ in column (5).[36] At $D = 1000$ the entire weight is given to the prior which is coming from the growth histories in all countries. As D decreases, investors increasingly form beliefs about a country's productivity growth process from the history of that country alone. The mean number of years in strong executive constraints is about 10 which implies that with $D = 10$, half the weight in the the calculation of the productivity growth parameters is based on country's own experience.

The results for $D = 10$ in column (4), Panel A suggests that a decrease in the variance of productivity growth by one standard deviation increases investment by about 90 percent. Thus, due to the reduction in volatility, the investment rate almost doubles with the adoption of strong executive constraints.

The structure of our empirical model in equation (11) assumes that firms maximize profits by investing in countries independently of their investments in other countries. An alternative view is that firms conduct investment as portfolio investments in which the covariance of the investment return with the existing investment portfolio matters. A full exploration of this alternative lies beyond the scope of this paper. However, it is worth noting that we do not find that the covariance with mean productivity growth in either the Netherlands, the OECD or the World has a significantly negative influence on investments.[37]

The results consistently suggest that $\hat{\gamma}_1 < 0$ which is consistent with the idea that strong executive constraints change investment inflows because investors expect the country to have a less volatile policy climate.[38] Furthermore, the variation across models in Table 5, Panel B is similar to the pattern we found in Table 4. This suggests that the construction of our measure from the GDP growth variance captures factors

[35] There is some time variation, particularly in $\hat{\sigma}^2_g(W,t)$. We explored the fact that $(\hat{\sigma}^2_{\varepsilon ct}(W) - \hat{\sigma}^2_{\varepsilon ct}(S))$ varies across time. Indeed, we find that the adoption of strong constraints at times of a larger difference in volatility is associated with a larger increase inflows.

[36] The value $D = 2$ is the lowest possible value that is theoretically sound given the updating formula.

[37] Results are presented in Table A3.

[38] In Appendix Table A4 we also show that the same pattern emerges using the OECD data. In Table A5 we use Dutch positive net inflows. In Table A6 we report results with different samples.

that influence both operational risk evaluations and investment. It bears remarking that the correlation between the estimated productivity variance and ONDD risk and investment appears to fall slightly with D which is consistent with the idea that priors are important for both risk evaluations and economic behavior. If our model is correct then investors learn from the performance of other countries when they evaluate rare institutional changes.

Our estimates of $\hat{\gamma}_2$ suggest that investors also respond to an improved outlook for trend productivity growth. An increase by one standard deviation increases investment inflows by between 37 and 96 percent. Thus, columns (2) to (4) emphasize that investment is, in principle, responsive to changes in trend productivity growth. However, *on average* trend productivity growth changes very little between strong and weak executive constraints and the adoption of strong executive constraints has very little impact through this channel. This will become even more clear when we explore the heterogeneity of transitions across countries in the following section.

3.2.4 The Heterogeneous Effect of Institutional Transitions

One advantage of fitting a specific model to the data compared to the difference-in-difference results is that we can gain an insight into heterogeneous effects across countries from institutional changes based on a specific mechanism. To do this, we can exploit both time-series and cross-sectional variation in $\{\widehat{mn}_{ct}, \widehat{var}_{ct}\}$. Countries have benefitted differentially from adopting strong constraints depending on their own particular reduction in policy risk and the effect this had on subsequent investment flows.

To illustrate the importance of heterogeneity across countries, we show how our model can be used to account for changes investment inflows for each country according to their specific experience.

We construct counterfactuals in which we imagine that the adoption of strong executive constraints did not change either the mean or the standard deviation of growth. We then compare these counterfactuals to the actual values of the fitted model to gain an estimate of the investment flow due to the path of $\{\widehat{mn}_{ct}, \widehat{var}_{ct}\}$ taken by a country according to our model. This gives us an estimate of the change in investment flows which can be attributed to the changing mean and variance for each country.

Table 6 column (1) gives the average yearly investment inflows during the episode of strong executive constraints for each country that changed institutions over our time period.[39] Flows varied significantly between countries with those in Eastern Europe experiencing gross yearly inflows of more than three billion EUR per year. To generate the predicted flows in column (2), we use the estimates from Table 4, column (4), Panel B. The fitted values in column (2) predict the country experience reasonably well.[40]

Columns (3) and (5) report two estimates of how the trend and variance in productivity growth matter for each country. In column (3), we predict investment inflows supposing that $\widehat{mn}_{ct}$ had not change when strong executive constraints were introduced. For each country this gives a counterfactual investment inflow

[39] We report results for a sub-set of countries that permanently adopted strong executive constraints in Table A7. This table uses the estimates in Table A6, column (4).

[40] If we run a linear OLS regression of actual and fitted FDI flows for both strong and weak executive constraints we get an adjusted R-squared of 0.67.

holding all other influences on investment fixed. We can then compare this to the prediction based on the actual path of $\widehat{mn}_{ct}$ that we have calculated for each country. In column (5) we do something similar holding the the variance of productivity growth fixed as our counterfactual. Heterogeneity across countries in these estimates is now dependent on a country's growth history and its effect on $\{\widehat{mn}_{ct}, \widehat{var}_{ct}\}$.

Column (4) looks at mean growth, $\widehat{mn}_{ct}$ by comparing columns (2) and (3). It reports the log difference between inflows with and without the country-specific change in trend growth. There is a wide range of estimates. A number like -43% in the case of Hungary suggests that the decline in trend growth in Hungary reduced investment inflows by about 43 percent compared to the counterfactual. Column (4) also illustrates why the impact of strong executive constraints through mean growth is fairly small on average. A similar number of countries have positive and negative experiences with some seeing improved and others deteriorating growth after adopting strong executive constraints. On average, the mean effect of adoption is very close to zero which is in line with the reduced form effect. This heterogeneity is in line with the predictions of our theoretical model and suggests that there is heterogeneity in the performance of countries under weak and strong executive constraints.

Column (6) reports the implications of changes in the variance of growth, $\widehat{var}_{ct}$, by comparing columns (2) and (5). The counterfactual is now the adoption of strong executive constraints without a change in (expected) variance. The estimates are now uniformly positive, illustrating that the reduction in $\widehat{var}_{ct}$ led to an increase in investment inflows in all countries which adopted strong executive constraints in our data. In some countries the counterfactual suggests a very large impact of the variance reduction. For example, we predict that yearly gross investment flows into Poland would have been about 2 billion EUR less if strong executive constraints had not lowered the expected variance of productivity growth. According to our model, Turkey would have experienced a reduction of gross investment inflows by over 600 million EUR without the variance reduction. Many more countries from all regions of the world are estimated to have benefitted massively from the reduction of growth volatility.

Of course, it could easily be the case that forcing the effect of institutions to work through trend productivity growth and the volatility of productivity growth is limiting. However, one finding is that the model does a very decent job at predicting the magnitude of the average experience, it predicts an overall impact of a change from weak to strong executive constraints of around 100 percent in investment inflows which is similar in magnitude to what we found in the reduced-form approach.

The results in Table 6 illustrate the importance of understanding the range of experience from a change in institutions which depend, according to the mechanism under investigation here, on the specific performance in terms of the mean and volatility of productivity growth. The average effects from difference-in-difference masks the possibility that the benefits from institutional change are likely to be country specific based on how average productivity and volatility change when institutional reforms take place.

4 Concluding Comments

Much of the literature on the importance of institutions is unspecific about the mechanism at work. Having observed a robust reduced-form relationship between investment inflows and strong executive constraints, we have suggested a political economy approach. The starting point is the observation that, while mean effects are equivocal, there is a robust link between strong executive constraints and reduced volatility in growth. This motivates an economic channel working through risk and investment incentives where capital is committed before productivity shocks are realized.

Nothing in our analysis *proves* that the mechanism by which institutions matter for investment is through changes in the profile of productivity growth. But we feel that there is value in specificity and moving beyond reduced-forms. In particular, there is the discipline of articulating and then specifying a model for empirical purposes. This gives insights into potential sources of heterogeneity. We have also shown the predictions from the economic model are close (on average) to the magnitudes suggested by the reduced-form correlations. This would be impossible to know without first specifying a model and estimating the quantitative magnitudes.

We have provided both an empirical method and a theoretical framework in which to study the impact of political risk on economic activity. Political risk in our framework is generated by the fact that political actors directly affect productivity growth which implies that political risk can be studied with growth data. We have shown that the resulting measures of risk are correlated with risk evaluations of market actors and investment behavior both from the Netherlands and the OECD more generally.

We have formulated a theory and an approach which does not differentiate between investment by foreign owned firms in a sector. Indeed, unless domestic firms are somehow insulated from policy-induced productivity shocks, the theory should apply equally well to domestic firms. The reason to focus on investment flows by foreign firms in our study comes from the fact that we have good data for Dutch multinationals for a range of countries which have reformed their political institutions over the relevant time period. It would be interesting in future to test the ideas developed here for domestic firms where we would expect similar considerations to emerge.

The results developed here offer a specific take on more general debates about the causes and consequences of political risk. Modern approaches to economic growth such as Aghion and Howitt (2006) have argued persuasively that the policy environment for growth is of first-order importance. An important role for political institutions can be to provide predictability in that policy environment, reducing policy risk. The benefits of improving institutions then go beyond mean comparisons and suggest a role for the impact of institutions on volatility. While investment is only one window on the economic consequences of this, discussions of risk are paramount in such cases. But there is a wider set of concerns about how policy risk due to weak institutions can have economic consequences and which merit further investigation.

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Table 1: Executive Constraints and Foreign Investment

Panel A: Sector Level

VARIABLES	(1) Investment Inflow	(2) Investment Inflow	(3) Investment Inflow	(4) Investment Inflow	(5) Inflow
strong executive constraints	0.802***	0.830***	0.799***	1.043***	0.100**
	(0.210)	(0.224)	(0.212)	(0.252)	(0.0450)
high openness		-0.117			
		(0.230)			
high competitiveness		0.352			
		(0.226)			
GDP per capita			1.32e-06		
			(9.84e-06)		
years of schooling				0.0214	
				(0.0683)	
country fixed effects	yes	yes	yes	yes	yes
exposure: total FDI flow	yes	yes	yes	yes	no
Observations	31,631	31,631	31,631	8,472	31,631
Number of country/sectors	1,319	1,319	1,319	1,440	1,319

Panel B: Country Level

VARIABLES	(1) Investment Inflow	(2) Investment Inflow	(3) Investment Inflow	(4) Investment Inflow	(5) Number of Sectors with Inflow	(6) Investment Inflow (from OECD)
strong executive constraints	0.677**	0.733**	0.675**	0.910**	0.130**	0.595***
	(0.299)	(0.301)	(0.301)	(0.374)	(0.0644)	(0.221)
high openness		-0.200				
		(0.126)				
high competitiveness		0.476				
		(0.307)				
GDP per capita			5.90e-07			
			(1.14e-05)			
years of schooling				0.00522		
				(0.0743)		
country fixed effects	yes	yes	yes	yes	yes	yes
exposure: total FDI flow	yes	yes	yes	yes	no	yes
Observations	3,859	3,859	3,859	840	3,859	3,736
Number of countries	154	154	154	140	154	154

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All columns report results from a fixed effects poisson regression. Columns (1) to (4) and (6) use the exposure option. The exposure variable is the sum of foreign investment flows in the same year. Dependant variable in columns (1) to (4) is the gross investment inflow from the Netherlands into the country or country/sector. Column (5) uses a dummy that records a positive inflow in Panel A and the number of sectors with inflows in Panel B. Dependant variable in column (6) is the flow of investment from all OECD countries. Column (4) uses 5-year averages of the executive constraint variable for the five years around 1985, 1990, 1995, 2000, 2005 and 2010. All explanatory variables are lagged by one year except for in column (4).

Table 2: Additional Results and Robustness

Panel A: Sector Level

VARIABLES	(1) Property Rights Investment Inflow	(2) Post Cold War Investment Inflow	(3) Time Dummies Investment Inflow	(4) Net Inflows Investment Inflow	(5) Share of Global Flows Share of Global Investment Flow
strong executive constraints	0.771***	0.783***	0.665***	0.804***	0.929***
	(0.210)	(0.267)	(0.209)	(0.210)	(0.194)
protection of property rights	0.216***				
	(0.0664)				
country/sector fixed effects	yes	yes	yes	yes	yes
exposure: total FDI flow	yes	yes	no	yes	no
year fixed effects	no	no	yes	no	no
Observations	11,226	24,026	31,631	30,892	31,631
Number of country/sectors	863	1,290	1,319	1,289	1,319

Panel B: Country Level

VARIABLES	(1) Investment Inflow	(3) Investment Inflow	(5) Investment Inflow	(4) Investment Inflow	(6) Share of Global Investment Flow
strong executive constraints	0.707***	0.631*	0.679**	0.549*	0.722**
	(0.264)	(0.365)	(0.300)	(0.287)	(0.289)
protection of property rights	0.268***				
	(0.0926)				
country fixed effects	yes	yes	yes	yes	yes
exposure: total FDI flow	yes	yes	no	yes	no
year fixed effects	no	no	yes	no	no
Observations	1,627	2,853	3,859	3,832	3,859
Number of countries	116	154	154	153	154

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All columns report results from a fixed effects poisson regression. Dependant variable in columns (1) to (3) is the gross investment flows from the Netherlands into the country or country/sector. Dependant variable in column (4) is the net investment flow from the Netherlands conditional on the flow being positive. Dependant variable in column (5) is the share of global investment flows that goes into country or country/sector. All explanatory variables are lagged by one year. Column (2) uses only data after 1991.

Table 3: Executive Constraints and Growth (1970-2010)

Panel A: GDP per Capita Growth Data

Sample	Constraints	Obs	Mean	Variance
whole sample	strong executive constraints	1676	0.022	0.0019
	weak executive constraints	4002	0.019	0.0069
countries with at least five years in strong and weak executive constraints	strong executive constraints	534	0.023	0.0019
	weak executive constraints	811	0.021	0.0062

Panel B: Calculated Productivity Growth (assuming alpha=0.66 and eta=0.75)

Sample	Constraints	Obs	Mean	Variance
whole sample	strong executive constraints	1676	0.040	0.0076
	weak executive constraints	4002	0.046	0.0281
countries with at least five years in strong and weak executive constraints	strong executive constraints	534	0.042	0.0077
	weak executive constraints	811	0.047	0.0255

Notes: Units are country/years. Sample are all countries between 1970-2010. Growth is GDP per capita growth (not in percent).

Table 4: Political Credit Risk

VARIABLES	(1) Updating on World Data Alone political risk	(2) Updating on Country Data (D = 1000) political risk	(3) Updating on Country Data (D = 100) political risk	(4) Updating on Country Data (D = 10) political risk	(5) Updating on Country Data (D = 2) political risk
variance of productivity growth (estimated on world level)	0.683***				
	(0.118)				
mean productivity growth (estimated on world level)	-1.012***				
	(0.0809)				
variance of productivity growth (estimated on country level)		1.023***	0.882***	0.695***	0.446**
		(0.214)	(0.191)	(0.191)	(0.217)
mean productivity growth (estimated on country level)		-0.944***	-0.888***	-1.009***	-1.154***
		(0.240)	(0.211)	(0.243)	(0.218)
Country fixed effects	yes	yes	yes	yes	yes
Observations	578	578	578	578	578
Whithin adj. R-Squared	0.541	0.103	0.167	0.273	0.316
Number of countries	34	34	34	34	34

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All columns report results from a fixed effects OLS regression. Dependant variable is the political credit risk rating from ONDD. Risk measures the credit default risk in the short term (less than 1 year). The sample is restricted to countries that changed level of executive constraints between high and low executive constraints once and excludes the Lebanon. "D=1000" means that the prior is given a weight equivalent to 1000 country/year observations. This implies that the growth history of the country receives very little weight. "D=2" means that the prior is given a weight equivalent to 2 country/year observation. This gives most weight to the country-specific history. We set beta=0.66 and eta=0.75.

Table 5: Instpecting the Mechanism

Panel A: Sector Level

	(1)	(2)	(3)	(4)	(5)
	Updating on World Data Alone	Updating on Country Data (D = 1000)	Updating on Country Data (D = 100)	Updating on Country Data (D = 10)	Updating on Country Data (D = 2)
VARIABLES	Investment Inflow	Investment Inflow	Investment Inflow	Investment Inflow	Investment Inflow
variance of productivity growth (estimated on world level)	-0.335***				
	(0.127)				
mean productivity growth (estimated on world level)	0.116				
	(0.0817)				
variance of productivity growth (estimated on country level)		-1.287***	-1.031***	-0.877***	-0.621***
		(0.412)	(0.166)	(0.180)	(0.196)
mean productivity growth (estimated on country level)		0.964**	0.662***	0.337***	0.374**
		(0.380)	(0.149)	(0.126)	(0.148)
country/sector fixed effects	yes	yes	yes	yes	yes
control of total FDI flow	yes	yes	yes	yes	yes
Observations	7,696	7,668	7,668	7,668	7,668
Number of countrysectorid	313	313	313	313	313

Panel B: Country Level

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Investment Inflow	Investment Inflow	Investment Inflow	Investment Inflow	Investment Inflow
variance of productivity growth (estimated on world level)	-0.274				
	(0.175)				
mean productivity growth (estimated on world level)	0.116				
	(0.116)				
variance of productivity growth (estimated on country level)		-1.125**	-1.020***	-0.805***	-0.482*
		(0.491)	(0.219)	(0.237)	(0.253)
mean productivity growth (estimated on country level)		0.885**	0.724***	0.436***	0.541***
		(0.437)	(0.141)	(0.106)	(0.172)
country fixed effects	yes	yes	yes	yes	yes
control of total FDI flow	yes	yes	yes	yes	yes
Observations	881	878	878	878	878
Number of countries	34	34	34	34	34

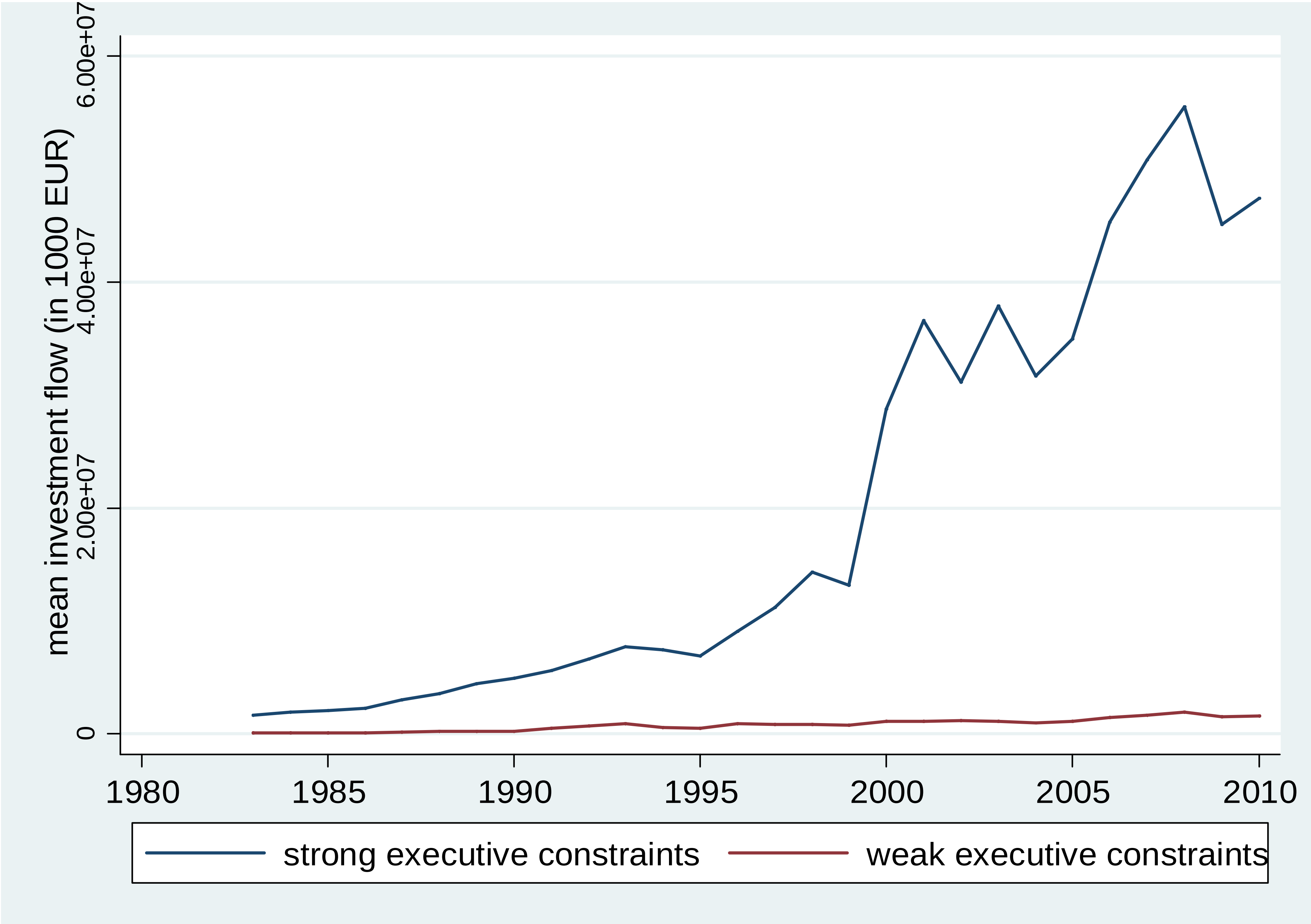
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All columns report results from a fixed effects poisson regression. Dependant variable is the total investment flows that year (in that sector) that goes into country. All explanatory variables are lagged by one year and weighted by their standard deviations. The sample is restricted to countries that changed level of executive constraints between high and low executive constraints once and excludes the Lebanon. "D=1000" means that the prior is given a weight equivalent to 1000 country/year observations. This implies that the growth history of the country receives very little weight. "D=2" means that the prior is given a weight equivalent to 2 country/year observation. This gives most weight to the country-specific history. We set beta=0.66 and eta=0.75.

Table 6: Counterfactual FDI Flows

country	(1) mean yearly investment inflows	(2) (I) fitted value of investment inflows	(3) adoption of strong constraints without change in mean productivity growth (II) simulated fitted value of investment inflows	(4) ln(II)-ln(I) effect of change in mean on inflow	(5) adoption of strong constraints without change in variance of productivity growth (III) simulated fitted value of investment inflows	(6) ln(III)-ln(I) effect of change in variance on inflow
Albania	82,958	77,212	38,274	**70%**	33,135	**85%**
Argentina	278,610	275,848	272,328	**1%**	189,446	**38%**
Bolivia	90,527	79,900	121,601	**-42%**	38,727	**72%**
Botswana	11,054	12,227	38,302	**-114%**	1,794	**192%**
Bulgaria	330,221	308,746	741,002	**-88%**	273,354	**12%**
Chile	594,719	599,836	292,535	**72%**	95,216	**184%**
Colombia	240,063	95,481	100,881	**-6%**	78,804	**19%**
Croatia	586,062	595,730	358,468	**51%**	67,109	**218%**
Ecuador	70,398	101,148	232,914	**-83%**	44,853	**81%**
Greece	1,025,297	1,025,348	1,252,401	**-20%**	339,301	**111%**
Haiti	2,494	2,821	2,742	**3%**	1,725	**49%**
Hungary	2,271,429	2,202,779	3,373,187	**-43%**	1,403,104	**45%**
Kenya	127,670	125,369	106,334	**16%**	96,463	**26%**
Lesotho	1,432	1,366	1,436	**-5%**	96	**265%**
Macedonia, for	15,236	14,601	8,989	**49%**	3,874	**133%**
Madagascar	13,450	4,791	3,428	**33%**	3,060	**45%**
Mongolia	457	427	687	**-47%**	314	**31%**
Nicaragua	11,369	12,694	11,117	**13%**	187	**422%**
Niger	47	37,099	25,306	**38%**	9,671	**134%**
Pakistan	24,821	29,151	31,350	**-7%**	16,859	**55%**
Paraguay	25,073	26,724	59,231	**-80%**	11,532	**84%**
Peru	142,389	224,874	168,639	**29%**	79,787	**104%**
Philippines	15,319	164,640	155,847	**5%**	101,641	**48%**
Poland	3,700,832	3,641,016	2,660,551	**31%**	1,287,986	**104%**
Romania	3,309,029	2,834,956	2,937,151	**-4%**	1,064,270	**98%**
Slovakia	1,185,843	1,183,779	1,088,749	**8%**	227,423	**165%**
South Africa	1,260,622	1,309,647	1,502,538	**-14%**	205,578	**185%**
Sudan	77	9,901	8,119	**20%**	3,813	**95%**
Taiwan	1,503,181	1,390,832	3,127,530	**-81%**	841,373	**50%**
Thailand	602,490	476,212	811,212	**-53%**	345,501	**32%**
Turkey	1,342,450	1,337,265	1,365,853	**-2%**	697,123	**65%**
Uruguay	193,514	194,762	138,043	**34%**	70,870	**101%**
			AVERAGE:	**-7%**	**AVERAGE:**	**105%**

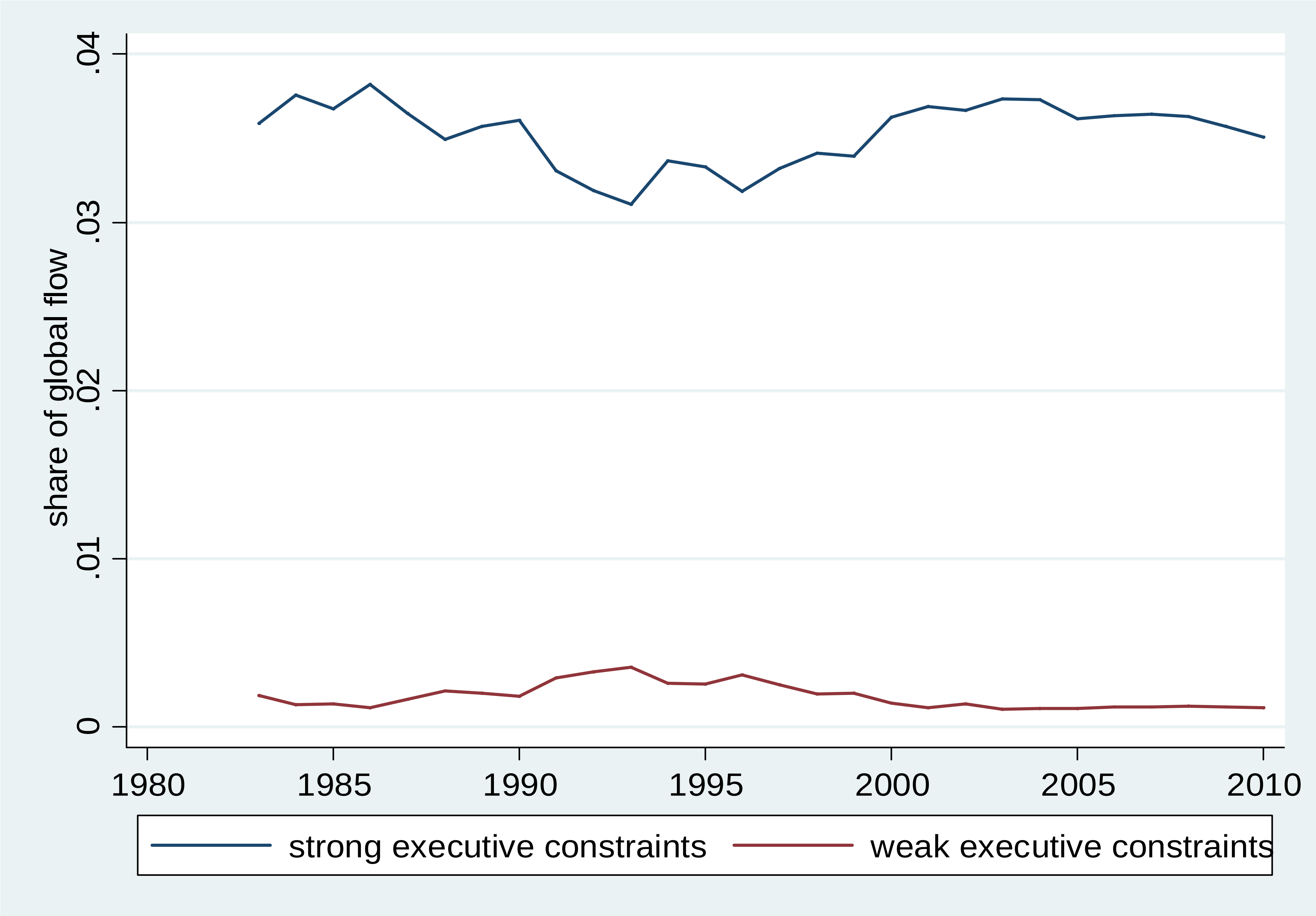
Notes: All inflows are average yearly inflows during strong executive constraints (in 1000 EUR). "mean yearly inflows" is the actualy average yearly inflow of investment into the country. "fitted value of investment inflows" is the fitted value from Table 4, Column (4), Panel B. "simulated fitted value of investment inflows" replaces the mean (in (II)) and the variance (in (III)) in the episode with strong executive constraints with the average mean and variance in the episode with weak executive constraints. The difference between (I) and (II) ((III) respecitvely) captures the effect of changes in the expected mean (variance) on investment inflows in the model. Values are not calculated for Nigeria and Kyrgystan as these countries only have one year under strong executive constraints.

Figure 1: Investment Inflows over Time (Mean Flow)



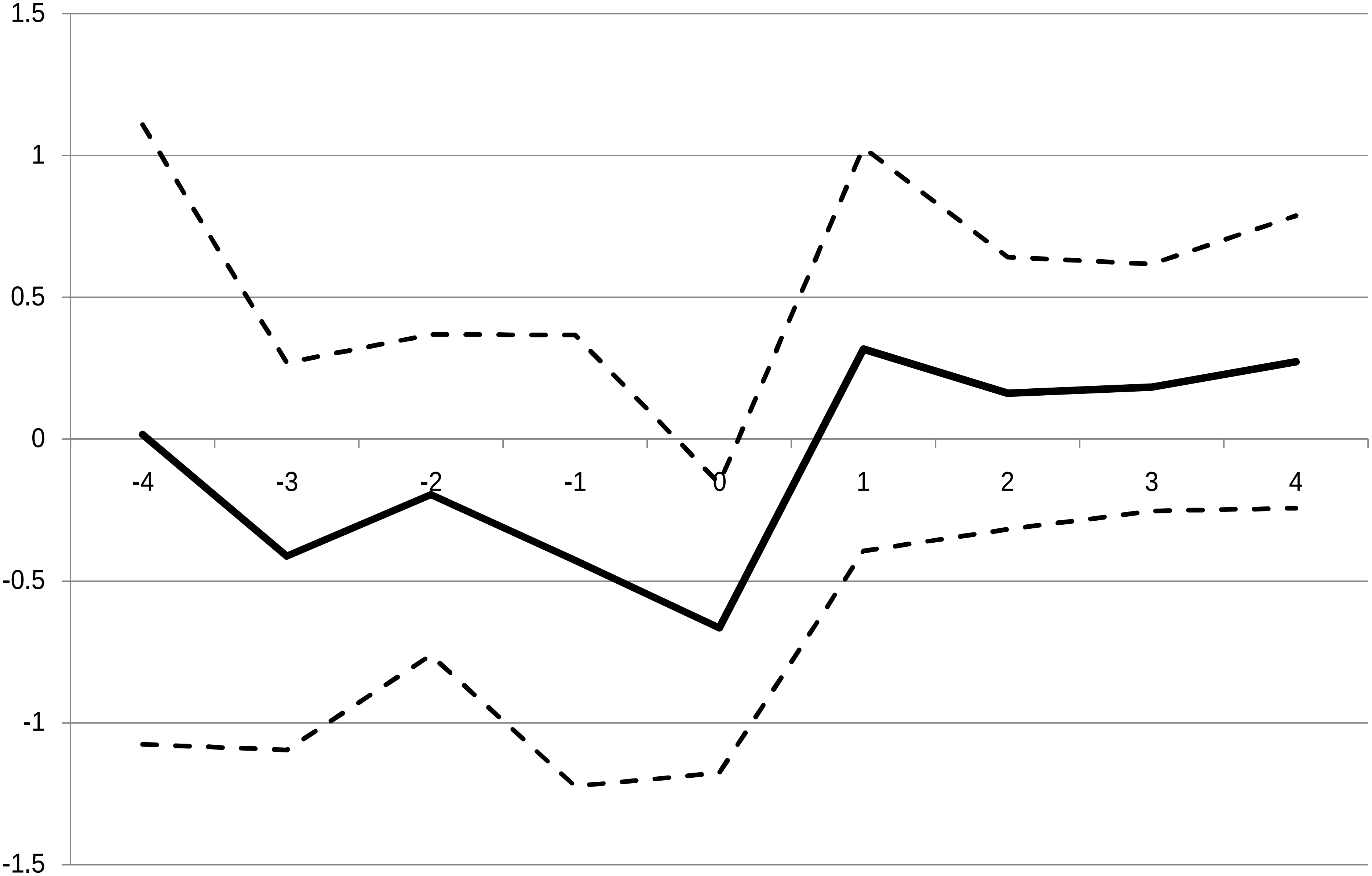
Note: Graphs shows average for countries that were always in strong or weak executive constraints.

Figure 2: Investment Inflows over Time (Mean Share)



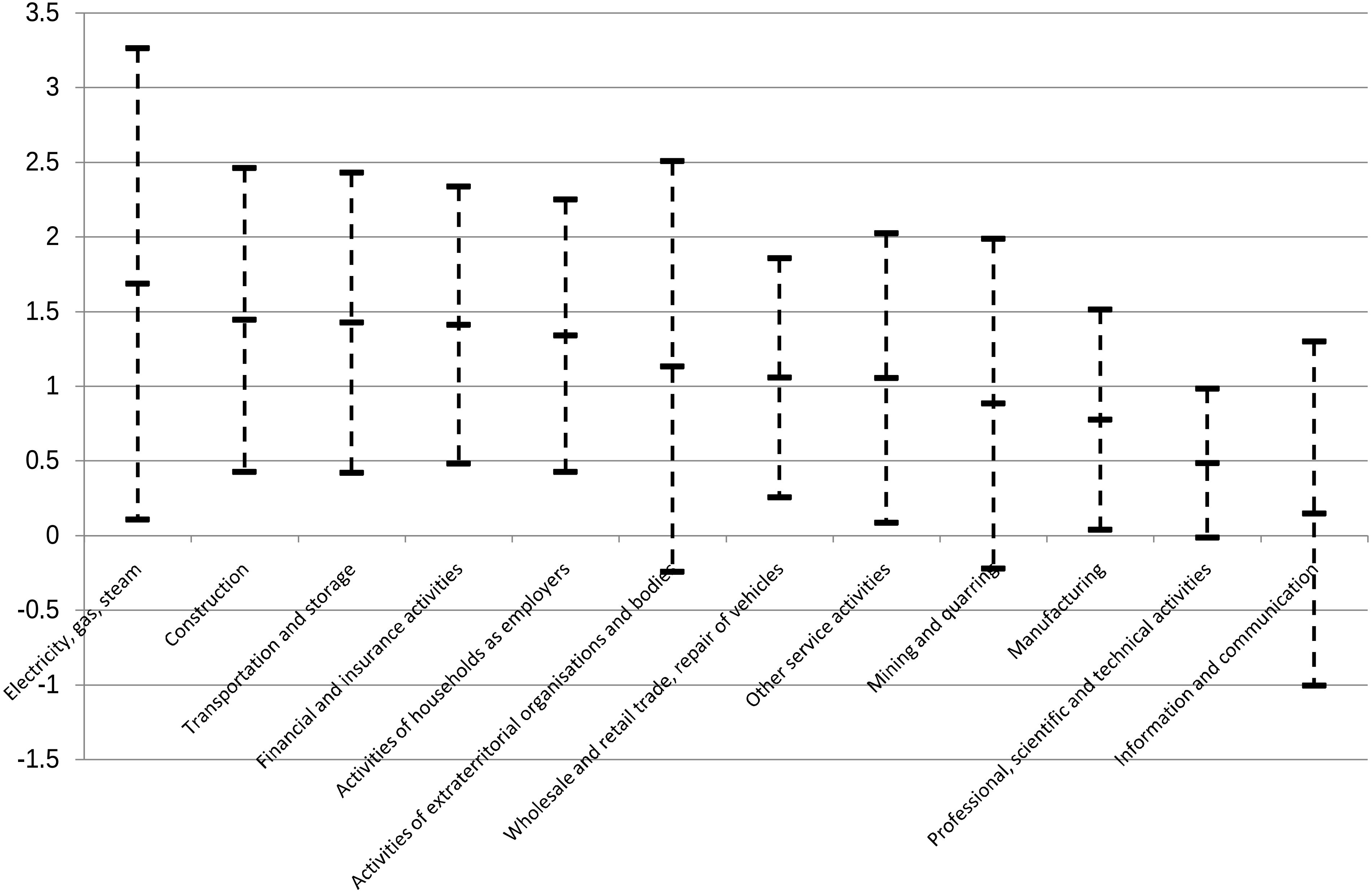
Note: Graphs shows average for countries that were always in strong or weak executive constraints.

Figure 3: Adoption of Strong Executive Constraints



Solid line shows coefficients on leads and lags around the adoption date (at 0) of strong executive constraints plus the coefficient on the “strong executive constraints” dummy. Dashed lines show 95% confidence intervals using the standard deviation of the lead and lag coefficients.

Figure 4: Sector Heterogeneity



Note: Figure displays regression coefficients and 95% confidence intervals. Coefficients come from a regression as in Table (1), Column (1) in which executive constraints are interacted with a set of 12 sector dummies.

Figure 5: Executive Constraints and GDPpc Growth

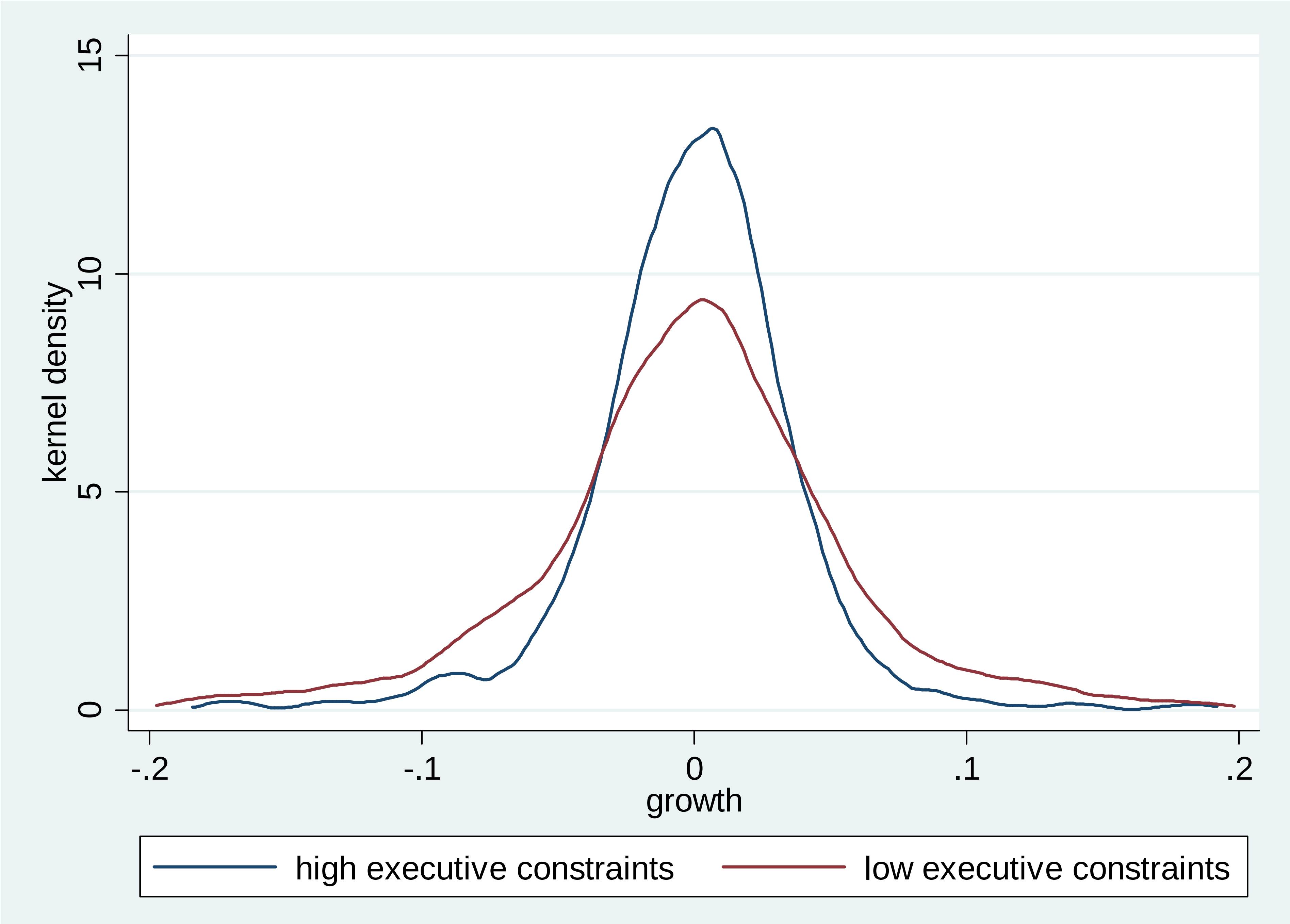
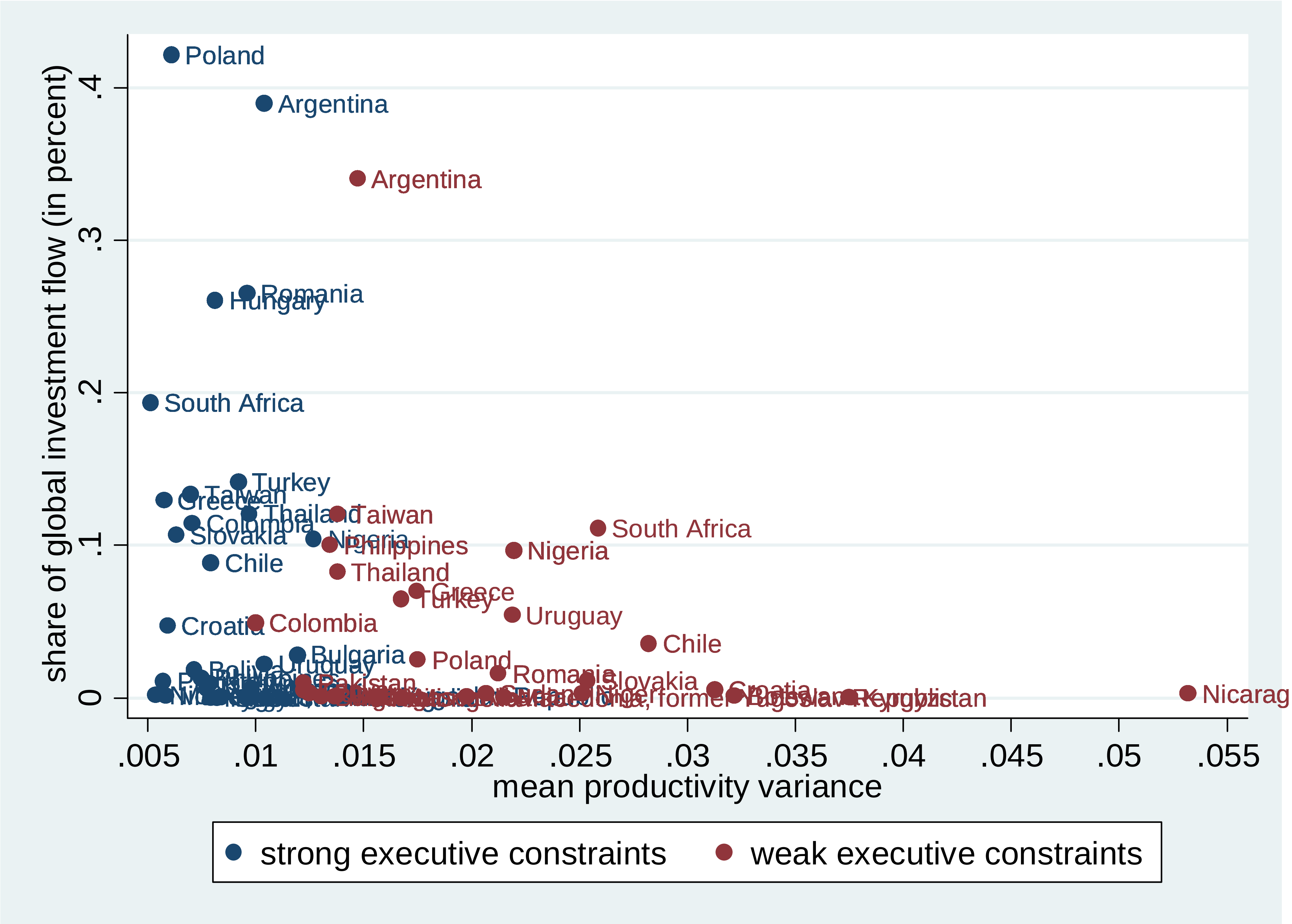


Figure 6: Executive Constraints, Stability and Foreign Investments – D=10



Institutions, Volatility and Investment

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Appendix

A The Economic Model

We first derive the formula for the profit maximizing capital stock. The representative form in sector i chooses its labor demand to maximize

$$\left[\left(\Gamma_t \rho_i L_{it}\right)^{\alpha} K_{it}^{1-\alpha}\right]^{\eta} - w_t L_{it}$$

This yields

$$L_{it} = Y_{it}\frac{\alpha\eta}{w_t}$$

so that in the aggregate it needs to hold that

$$w_t = Y_t \frac{\alpha\eta}{L}.$$

Plugging L_{it} into the firm's production function

$$Y_{it} = \left[\Gamma_t \rho_i\right]^{\alpha\eta} \left[\frac{\alpha\eta Y_{it}}{w_t}\right]^{\alpha\eta} K_{it}^{(1-\alpha)\eta} = \left[\Gamma_t \rho_i\right]^{\frac{\alpha\eta}{1-\alpha\eta}} \left[\frac{\alpha\eta}{w_t}\right]^{\frac{\alpha\eta}{1-\alpha\eta}} K_{it}^{\frac{(1-\alpha)\eta}{1-\alpha\eta}}$$

and plugging in w_t implies for aggregate output

$$Y_t = \left(\Gamma_t L\right)^{\alpha\eta} \left(\sum \pi_i \rho_i^{\frac{\alpha\eta}{1-\alpha\eta}} K_{it}^{\frac{(1-\alpha)\eta}{1-\alpha\eta}}\right)^{1-\alpha\eta}$$

so if we define

$$\hat{K}_t \equiv \left(\sum \pi_i \rho_i^{\frac{\alpha\eta}{1-\alpha\eta}} K_{it}^{\frac{(1-\alpha)\eta}{1-\alpha\eta}}\right)^{1-\alpha\eta}$$

aggregate output can be written

$$Y_t = \left[\Gamma_t L\right]^{\alpha\eta} \left(\hat{K}_t\right)$$

and plugging this back into the firm-level production function

$$Y_{it} = \left(\Gamma_t L\right)^{\alpha\eta} \rho_i^{\frac{\alpha\eta}{1-\alpha\eta}} \left(\hat{K}_t\right)^{-\frac{\alpha\eta}{1-\alpha\eta}} K_{it}^{\frac{(1-\alpha)\eta}{1-\alpha\eta}}$$

using the above equation, the firm-level expected profit function is

$$\left(1-\alpha\eta\right) E Y_{it} - r K_{it} = \left(1-\alpha\eta\right) E\left[\left(\Gamma_t\right)^{\alpha\eta}\right] \left(L\right)^{\alpha\eta} \rho_i^{\frac{\alpha\eta}{1-\alpha\eta}} \left(\hat{K}_t\right)^{-\frac{\alpha\eta}{1-\alpha\eta}} K_{it}^{\frac{(1-\alpha)\eta}{1-\alpha\eta}} - r K_{it}$$

so that the first order condition for choice of capital is

$$(1-\alpha)\,\eta E\left[(\Gamma_t)^{\alpha\eta}\right] L^{\alpha\eta}\rho_i^{\frac{\alpha\eta}{1-\alpha\eta}} K_{it}^{\frac{[1-\alpha]\eta}{1-\alpha\eta}-1}\left(\hat{K}_t\right)^{-\frac{\alpha\eta}{1-\alpha\eta}} = r$$

which implies that the capital stock follows expected output according to

$$K_{it} = (1-\alpha)\,\eta\frac{E\left[Y_{it}\right]}{r}.$$

Now to complete the solution. Note that expected firm-level output is

$$\begin{aligned} E\left[Y_{it}\right] &= E\left[(\Gamma_t)^{\alpha\eta}\right]\rho_i^{\frac{\alpha\eta}{1-\alpha\eta}}\left[[1-\alpha]\,\eta\frac{E\left[Y_{it}\right]}{r}\right]^{\frac{(1-\alpha)\eta}{1-\eta\alpha}}[L]^{\alpha\eta}\left(\hat{K}_t\right)^{-\frac{\alpha\eta}{1-\alpha\eta}} \\ &= E\left[(\Gamma_t)^{\alpha\eta}\right]\rho_i^{\frac{\alpha\eta}{1-\eta}}\left[\frac{(1-\alpha)\,\eta}{r}\right]^{\frac{(1-\alpha)\eta}{1-\eta}}[L]^{\frac{\alpha\eta(1-\alpha\eta)}{1-\eta}}\left(\hat{K}_t\right)^{-\frac{\alpha\eta}{1-\eta}}. \end{aligned}$$

We now use this to solve for $\hat{K}_t$.

$$\begin{aligned} \hat{K}_t &= \left[\frac{(1-\alpha)\,\eta}{r}\right]^{[1-\alpha]\eta}\left(\sum\pi_i\rho_i^{\frac{\alpha\eta}{1-\alpha\eta}}\left(E\left[Y_{it}\right]\right)^{\frac{[1-\alpha]\eta}{1-\alpha\eta}}\right)^{1-\alpha\eta} \\ &= \left[\frac{(1-\alpha)\,\eta}{r}\right]^{\frac{([1-\alpha]\eta)(1-\alpha\eta)}{1-\eta+[1-\alpha]\alpha\eta^2}}\left(\sum\pi_i\rho_i^{\frac{\alpha\eta}{(1-\eta)}}\right)^{\frac{(1-\eta)(1-\alpha\eta)}{1-\eta+[1-\alpha]\alpha\eta^2}}[L]^{\frac{\alpha\eta(1-\alpha\eta)[1-\alpha]\eta}{1-\eta+[1-\alpha]\alpha\eta^2}}\left(E\left[(\Gamma_t)^{\alpha\eta}\right]\right)^{\frac{(1-\eta)[1-\alpha]\eta}{1-\eta+[1-\alpha]\alpha\eta^2}}. \end{aligned}$$

Inserting this back into the output equation implies that per capita output moves according to

$$y_t = B\left[\Gamma_t\right]^{\alpha\eta}\left(E\left[(\Gamma_t)^{\alpha\eta}\right]\right)^{\frac{(1-\eta)[1-\alpha]\eta}{1-\eta+[1-\alpha]\alpha\eta^2}}.$$

B Proofs of Propositions

Proof of Proposition 1: The variance of ε_t with strong executive constraints variance can be written as:

$$\lambda\,(1-\lambda)\left[(1-\beta_H)\,\Delta_H-(1+\beta_L)\,\Delta_L\right]^2+\sigma_\omega^2$$

where

$$\beta_H = \left(\frac{\Delta_H-\Delta_0}{\Delta_H}\right)\phi_H \text{ and } \beta_L = \left(\frac{\Delta_0-\Delta_L}{\Delta_L}\right)\phi_L.$$

This variance is lower than under weak executive constraints since:

$$\Delta_H-\Delta_L > (1-\beta_H)\,\Delta_H-(1+\beta_L)\,\Delta_L$$

as claimed. ■

Proof of Proposition 2: Using the results above, we know that the firm level capital stock is given by:

$$\begin{aligned} K_{it} &= \frac{[1-\alpha]\,\eta}{r} E\left[(\Gamma_t)^{\alpha\eta}\right] \rho_i^{\frac{\alpha\eta}{1-\eta}} \left[\frac{(1-\alpha)\,\eta}{r}\right]^{\frac{[1-\alpha]\eta}{1-\eta}} [L]^{\frac{\alpha\eta(1-\alpha\eta)}{1-\eta}} \\ &\times \left(\left[\frac{(1-\alpha)\,\eta}{r}\right]^{\frac{([1-\alpha]\eta)(1-\alpha\eta)}{1-\eta+[1-\alpha]\alpha\eta^2}} \left(\sum \pi_i \rho_i^{\frac{\alpha\eta}{(1-\eta)}}\right)^{\frac{(1-\eta)(1-\alpha\eta)}{1-\eta+[1-\alpha]\alpha\eta^2}} [L]^{\frac{\alpha\eta(1-\alpha\eta)[1-\alpha]\eta}{1-\eta+[1-\alpha]\alpha\eta^2}} \left(E\left[(\Gamma_t)^{\alpha\eta}\right]\right)^{\frac{(1-\eta)(1-\alpha)\eta}{1-\eta+[1-\alpha]\alpha\eta^2}}\right)^{-\frac{\alpha\eta}{1-\eta}}. \end{aligned}$$

Gathering terms related to $E\left[(\Gamma_t)^{\alpha\eta}\right]$ and labelling the remaining terms C_i, this becomes

$$K_{it} = C_i \times \left(E\left[(\Gamma_t)^{\alpha\eta}\right]\right)^{\frac{1-\eta}{1-\eta+[1-\alpha]\alpha\eta^2}}$$

Now using the fact that

$$E\left((\Gamma_t)^{\alpha\eta}\right) = e^{-\frac{[1-\alpha\eta]\alpha\eta}{2}\sigma_\varepsilon^2} \left(\Gamma_{t-1}\right)^{\alpha\eta} e^{\alpha\eta\kappa}$$

we obtain the following expression for the optimal capital stock of a representative firm i

$$\begin{aligned} \ln K_{it}^* &= \ln C_i - \frac{(1-\alpha\eta)\,\alpha\eta\,(1-\eta)}{2\left(1-\eta+(1-\alpha)\,\alpha\eta^2\right)}\sigma_\varepsilon^2 \\ &\quad + \frac{\alpha\eta\,(1-\eta)}{1-\eta+(1-\alpha)\,\alpha\eta^2}\kappa + \ln\left((\Gamma_{t-1})^{\alpha\eta}\right)^{\frac{1-\eta}{1-\eta+[1-\alpha]\alpha\eta^2}} \end{aligned}$$

which implies immediately that the optimal capital stock is increasing in κ and decreasing in σ_ε^2 as claimed.
■

C Productivity Growth and GDP per Capita Growth

In order to get an expression for mean growth we insert

$$\begin{aligned} E\left((\Gamma_t)^{\alpha\eta}\right) &= e^{-\frac{[1-\alpha\eta]\alpha\eta}{2}\sigma_\varepsilon^2} \left(\Gamma_{t-1}\right)^{\alpha\eta} e^{\alpha\eta\kappa} \\ \Gamma_t &= \Gamma_{t-1} e^{\kappa} e^{\varepsilon_t} \end{aligned}$$

into the equation for y_t to get

$$\begin{aligned} y_t &= B\left[\Gamma_{t-1} e^{\kappa} e^{\varepsilon_t}\right]^{\alpha\eta} \left[e^{-\frac{[1-\alpha\eta]\alpha\eta}{2}\sigma_\varepsilon^2} \left(\Gamma_{t-1}\right)^{\alpha\eta} e^{\alpha\eta\mu}\right]^{\frac{(1-\alpha\eta)(1-\alpha)\eta}{1-\eta+\alpha(1-\alpha)\eta^2}} \\ \ln y_t &= \ln B + \beta \ln\left(\Gamma_{t-1}\right) + \beta\kappa + \alpha\eta\varepsilon_t - \beta\frac{(1-\alpha\eta)\,(1-\alpha)\,\eta}{2}\sigma_\varepsilon^2 \end{aligned}$$

with $\beta = \frac{\alpha\eta}{1-\eta+\alpha\eta}$ so that mean growth is

$$\mu_g = E\left(\ln y_t - \ln y_{t-1}\right) = \beta\kappa - \frac{\alpha\eta}{2}\sigma_\varepsilon^2 - \beta\frac{(1-\alpha\eta)\,(1-\alpha)\,\eta}{2}\sigma_\varepsilon^2 \tag{1}$$

which we can combine with

$$\sigma_g^2 = (\alpha\eta)^2\,\sigma_\varepsilon^2$$

to solve for $\hat{\kappa}(\delta)$ as

$$\begin{aligned}
\hat{\kappa}(\delta) &= \frac{1}{\beta}\hat{\mu}_g + \frac{\alpha\eta}{\beta 2}\hat{\sigma}_\varepsilon^2 + \frac{(1-\alpha\eta)(1-\alpha)\eta}{2}\hat{\sigma}_\varepsilon^2 \\
&= \frac{1}{\beta}\hat{\mu}_g + \frac{1-\eta+\alpha\eta}{2}\hat{\sigma}_\varepsilon^2 + \frac{(1-\alpha\eta)(1-\alpha)\eta}{2}\hat{\sigma}_\varepsilon^2
\end{aligned}$$

or

$$\hat{\kappa}(\delta) = \frac{1-\eta+\alpha\eta}{\alpha\eta}\hat{\mu}_g(\delta) + \frac{1-\alpha\eta^2+\alpha^2\eta^2}{2(\alpha\eta)^2}\hat{\sigma}_g^2(\delta) \quad (2)$$

and

$$\hat{\sigma}_\varepsilon^2(\delta) = \left(\frac{\hat{\sigma}_g(\delta)}{\alpha\eta}\right)^2. \quad (3)$$

D Data Description

This appendix explains data sources and definitions in particular for political institutions and our investment data. Summary statistics are in Table A0.

D.1 Political Institutions

The data on political institutions come from the Polity IV data base whose manual is available at http://www.systemicpe from which the following descriptions are taken.

The executive constraints variable that we use is *xconst* available on a seven point scale. The manual explains the variable's construction as follows:

> "Operationally, this variable refers to the extent of institutionalized constraints on the decision making powers of chief executives, whether individuals or collectivities. Such limitations may be imposed by any "accountability groups." In Western democracies these are usually legislatures. Other kinds of accountability groups are the ruling party in a one-party state; councils of nobles or powerful advisors in monarchies; the military in coup-prone polities; and in many states a strong, independent judiciary. The concern is therefore with the checks and balances between the various parts of the decision-making process."

There is a value of one where there is unlimited authority in which there are no regular limitations on the executive's actions (as distinct from irregular limitations such as the threat or actuality of coups and assassinations) and category seven is executive parity or subordination where accountability groups have effective authority equal to or greater than the executive in most areas of activity. Appendix Figure A1 shows the share of countries with a score of xconst equal to 7. The share went from around 0.25 in the 1980s to over 0.35 in 2010.

Openness of executive recruitment is the variable *xropen* which is intended to capture the extent to which the politically active population has an opportunity to attain the position through a regularized process. This is on a four point scale. At one extreme a value of one denotes the most closed possibility where chief executives are determined by hereditary succession and includes kings, emperors, beys, emirs, etc. A score of four (maximal openness) denotes the case where chief executives are chosen by elite designation, competitive election, or transitional arrangements that fall between designation and election.

Competitiveness of executive recruitment is the variable *xrcomp* which tries to capture the to which "prevailing modes of advancement give subordinates equal opportunities to become superordinates". The lowest score of one denotes the case where chief executives are determined by hereditary succession, designation, or by a combination of both, as in monarchies whose chief minister is chosen by king or court. The highest score of three goes to countries where chief executives are typically chosen in or through competitive elections matching two or more major parties or candidates.

D.2 Investment Inflows

Data comes from the Dutch central bank, De Nederlandsche Bank (DNB). The definition of Investment Inflows used by the Bank in this period comes from the IMF Best Practice Manual 5.0. According to this definition direct investments are transactions relating to movements in share capital by foreign-owned enterprises, i.e. equity participations which are conducted with a *lasting interest*. The *lasting interest* is defined through the existence of a long-term relationship between the direct investor and the enterprise and a significant degree of influence by the investor on the management of the enterprise.

An investment inflow in our data consists of three different investment flows: equity capital, reinvested earnings and other capital flows. Debt and equity are reported directly by reporting agents. Reinvested earnings is calculated by the Dutch Central Bank as the difference between 'result' in financial year (which is reported) and dividend in financial year (which is also reported). Equity and reinvested earnings are both direct results of capital investments (shareholders' equity). Other capital contains all other intercompany flows, mainly loans.

A special feature of the Dutch data is that it contains regular entities and special purpose entities (SPEs). In fact, more than half the investment flows we observe in our sample of countries comes from SPEs. An SPE is a legal entity that is created to fulfill narrow, specific or temporary objectives. This serves two purposes. First, SPEs are used by companies to isolate the firm from financial risk. Normally a company will transfer assets to the SPE for management or use the SPE to finance a large project thereby achieving a narrow set of goals without putting the entire firm at risk. Secondly, SPEs are also used to hide debt (inflating profits), hide ownership, and obscure relationships between different entities which are in fact related to each other. In order to reduce the impact of the second motivation on our estimation we excluded tax havens and very small countries with less than 1,000,000 inhabitants.

We aggregate the data into the 12 largest sectors to avoid having too many zeros. These 12 sectors contain more than 99% of all the FDI conducted from the Netherlands.

We focus on gross inflows for most of this study as this generates a number which is either zero or strictly positive (we set exceptions =0). In order to provide a sense of net inflows we also study positive net inflows. The difference to gross flows is generated by, for example, repatriated profits. For this we calculate the net inflow and set it equal to 0 in country/sector/years in which it is negative. In addition, we study whether a country/sector had any inflow at all in a given year.

In order to be sure that our results are not driven by particularities of the Dutch data we gathered investment flow data on the country level from the OECD web page. Again we focus on positive flows into "partner" countries, i.e. outflows, from all OECD countries. This number is most closely comparable to our positive net inflow in the Dutch Investment data. Flows are given in Million USD. We were able to match data for 158 countries between 1985 and 2010.

D.3 Other Data

D.3.1 Growth and GDP

Growth and real GDP data is from the Penn World Tables version 7.0 and is based on the rgdpl variable. Growth is the percentage points increase from one year to the next.

D.3.2 ONDD

Political risk is from the Belgian insurer Office National du Ducroire (ONDD). ONDD insures international transactions like credit and foreign direct investments against political risk like political violence or expropriation. Its insurance rates are linked to publicly available country ratings of political risk published on the ONDD web site. We use their numbers for short term and mid-term credit risks as these are available from 1994 till 2010. ONDD analysts meet four times a year to update the country risk ratings. Each country is reviewed at least once a year in one of the four quarterly meetings based on the country's geographic region. Countries that are not in the region under review can be added to the agenda in cases of political change that requires a reevaluation. Ratings go from 1 (low risk) to 7 (high risk). Columns (1) and (2) in Table 1 show that an increase of risk by one point corresponds to a decrease in foreign investment by around 10 percent. These categories are used to generate the prices charged for political risk insurance.

D.3.3 ICRG

Information on property rights protection is taken from the International Country Risk Guide. (ICRG) provided by the Political Risk Services (PRS) Group. Since 1984, PRS Group (2005a) has provided information on 12 risk indicators that address not only political risk but also various components of political institutions. We use their measure of risk of expropriation which is coded between 0 and 10 with higher scores implying better protection.

Table A0: Summary Statistics

Sample for Reduced Form					
Variable	Obs	Mean	Std. Dev.	Min	Max
Investment gross inflow (1000 EUR)	32622	467658.2	4805541	0	1.80E+08
Inflow (dummy)	32622	0.5174422	0.4997033	0	1
Investment net inflow (1000 EUR)	32622	93409.29	1042247	0	8.95E+07
strong executive constraints	32622	0.3775366	0.4847782	0	1

Sample for Mechanism Section (Only Countries that Switched)					
Variable	Obs	Mean	Std. Dev.	Min	Max
Investment gross inflow (1000 EUR)	3863	3949248	2.07E+07	0	2.93E+08
Inflow (dummy)	3863	4.369661	3.577366	0	12
Investment net inflow (1000 EUR)	3863	788816.4	4017310	0	1.05E+08
OECD inflow (Mio USD)	3741	3614.01	15559.4	0	284391.3
strong executive constraints	3863	4.369661	3.577366	0	12
world level estimates					
variance of productivity growth (estimated on world level)	885	0.01857	0.01076	0.00692	0.03436
mean productivity growth (estimated on world level)	885	0.03458	0.00351	0.02839	0.04188
country estimates, D=1000					
variance of productivity growth (estimated on country level)	882	0.01783	0.00931	0.00689	0.02797
mean productivity growth (estimated on country level)	882	0.03644	0.00558	0.02847	0.04438
country estimates, D=100					
variance of productivity growth (estimated on country level)	882	0.01704	0.00872	0.00663	0.03385
mean productivity growth (estimated on country level)	882	0.03552	0.00672	0.02516	0.05967
country estimates, D=10					
variance of productivity growth (estimated on country level)	882	0.01421	0.00903	0.00406	0.05737
mean productivity growth (estimated on country level)	882	0.03269	0.01989	-0.00980	0.11101
country estimates, D=2					
variance of productivity growth (estimated on country level)	882	0.01267	0.01140	0.00208	0.07922
mean productivity growth (estimated on country level)	882	0.03097	0.03096	-0.09758	0.13536

Table A1: Dynamic View Around the Adoption Date

VARIABLES	(1) Investment Inflow	(2) Investment Inflow	(3) Investment Inflow	(4) Investment Inflow
strong executive constraints		1.327***		1.049***
		(0.450)		(0.350)
4 years before switch	-0.513	0.0163	-0.417	-0.806**
	(0.615)	(0.557)	(0.298)	(0.323)
3 years before switch	-1.019***	-0.414	-0.931***	-1.364***
	(0.307)	(0.348)	(0.331)	(0.398)
2 years before switch	-0.967***	-0.197	-0.900**	-1.455***
	(0.274)	(0.288)	(0.363)	(0.449)
1 year before switch	-1.258***	-0.429	-0.802**	-1.362***
	(0.295)	(0.406)	(0.323)	(0.404)
year of switch	-1.266***	-1.734***	-0.908**	-0.562
	(0.274)	(0.261)	(0.397)	(0.506)
1 year after switch	-0.283	-0.751**	-0.256	-0.0115
	(0.462)	(0.363)	(0.749)	(0.800)
2 years after switch	-0.431	-0.906***	-0.951**	-0.849*
	(0.286)	(0.245)	(0.465)	(0.492)
3 years after switch	-0.623***	-0.885***	-1.205***	-1.094***
	(0.219)	(0.222)	(0.362)	(0.407)
4 years after switch	-0.577**	-0.796***	-0.425	-0.326
	(0.260)	(0.263)	(0.347)	(0.386)
country/sector fixed effects	yes	yes	yes	yes
exposure: total FDI flow	yes	yes	yes	yes
Observations	20,470	20,470	20,470	20,470
Number of countrysectorid	1,192	1,192	1,192	1,192

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Specification as in Table 1, column (1).Columns (1) and (2) study the adoption of strong executive constraints. Columns (3) and (4) study the adoption of weak executive constraints.

Table A2: Political Credit Risk and Executive Constraints

VARIABLES	(1) mid-term political risk (ONDD)	(2) short-term political risk (ONDD)	(3) protection of property rights	(4) mid-term political risk (ONDD)	(5) short-term political risk (ONDD)	(6) protection of property rights
strong executive constraints	-1.997***	-1.687***	1.702***	-0.430***	-0.827***	1.338***
	(0.0776)	(0.0739)	(0.105)	(0.127)	(0.252)	(0.385)
country fixed effects	no	no	no	yes	yes	yes
Observations	2,524	2,540	1,627	2,524	2,540	1,627
R-squared	0.213	0.168	0.140	0.023	0.025	0.045
Number of countryid	151	151	116	151	151	116

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. "mid-term" political risk is the credit risk rating for a time horizon of more than one year. "short-term" political risk is the credit risk rating for a time horizon of less than one year. "protection of property rights" is the ICRG ranking.

Table A3: Effect of Covariance with Mean Growth

	(1)	(2)	(3)
	World mean growth	OECD mean growth	Netherlands growth
VARIABLES	Investment Inflow	Investment Inflow	Investment Inflow
covariance of productivity growth with respective mean	-0.00848	-0.00974	-0.0840
	(0.110)	(0.0667)	(0.0938)
variance of productivity growth (estimated on country level)	-0.878***	-0.879***	-0.847***
	(0.181)	(0.181)	(0.186)
mean productivity growth (estimated on country level)	0.338***	0.337***	0.326**
	(0.123)	(0.126)	(0.130)
country/sector fixed effects	yes	yes	yes
control of total FDI flow	yes	yes	yes
Observations	7,635	7,635	7,635
Number of countrysectorid	313	313	313

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All columns report results from a fixed effects Poisson regression. Dependant variable is the total FDI flows that year (in that sector) that goes into country. All explanatory variables are lagged by one year and weighted by their standard deviations. The sample is restricted to countries that changed level of executive constraints between high and low executive constraints once and excludes the Lebanon. Columns (4) to (6) assume "D=10". We set beta=0.66 and eta=0.75. Covariance is the covariance of a country's growth with the World, OECD or Netherlands (average) growth in a ten year window up until that year.

Table A4: Inspecting the Mechanism (OECD data)

VARIABLES	(1) Updating on World Data Alone Investment Inflow	(2) Updating on Country Data (D = 1000) Investment Inflow	(3) Updating on Country Data (D = 100) Investment Inflow	(4) Updating on Country Data (D = 10) Investment Inflow	(5) Updating on Country Data (D = 2) Investment Inflow
variance of productivity growth (estimated on world level)	-0.310**				
	(0.121)				
mean productivity growth (estimated on world level)	0.103				
	(0.0759)				
variance of productivity growth (estimated on country level)		-0.795***	-0.780***	-0.683***	-0.382**
		(0.276)	(0.144)	(0.174)	(0.187)
mean productivity growth (estimated on country level)		0.561**	0.514***	0.287***	0.393***
		(0.239)	(0.108)	(0.0812)	(0.124)
country fixed effects	yes	yes	yes	yes	yes
control of total FDI flow	yes	yes	yes	yes	yes
Observations	851	848	848	848	848
Number of countrysectorid	34	34	34	34	34

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All columns report results from a fixed effects poisson regression. Dependant variable is the total OECD FDI flows that year that go into country. All explanatory variables are lagged by one year and weighted by their standard deviations. The sample is restricted to countries that changed level of executive constraints between high and low executive constraints once. D=1000 means that the prior is given a weight equivalent to 1000 country/year observations. This implies that the growth history of the country receives very little weight. D=2 means that the prior is given a weight equivalent to 2 country/year observation. This gives most weight to the country-specific history. We set beta=0.66 and eta=0.75.

Table A5: Instpecting the Mechanism (Positive Net Inflows)

Panel A: Sector Level

	(1)	(2)	(3)	(4)	(5)
	Updating on World Data Alone	Updating on Country Data (D = 1000)	Updating on Country Data (D = 100)	Updating on Country Data (D = 10)	Updating on Country Data (D = 2)
VARIABLES	Investment Inflow	Investment Inflow	Investment Inflow	Investment Inflow	Investment Inflow
variance of productivity growth (estimated on world level)	-0.280**				
	(0.112)				
mean productivity growth (estimated on world level)	-0.00811				
	(0.0907)				
variance of productivity growth (estimated on country level)		-0.561**	-0.689***	-0.555***	-0.289
		(0.245)	(0.156)	(0.171)	(0.203)
mean productivity growth (estimated on country level)		0.270	0.386**	0.202	0.337**
		(0.199)	(0.153)	(0.133)	(0.154)
country/sector fixed effects	yes	yes	yes	yes	yes
control of total FDI flow	yes	yes	yes	yes	yes
Observations	7,519	7,491	7,491	7,491	7,491
Number of countrysectorid	306	306	306	306	306

Panel B: Country Level

	(1)	(2)	(3)	(4)	(5)
VARIABLES	FDI Inflow	FDI Inflow	FDI Inflow	FDI Inflow	FDI Inflow
variance of productivity growth (estimated on world level)	-0.235				
	(0.154)				
mean productivity growth (estimated on world level)	0.0220				
	(0.127)				
variance of productivity growth (estimated on country level)		-0.548**	-0.701***	-0.509**	-0.154
		(0.271)	(0.184)	(0.204)	(0.239)
mean productivity growth (estimated on country level)		0.331	0.465***	0.309***	0.520***
		(0.232)	(0.177)	(0.118)	(0.193)
country fixed effects	yes	yes	yes	yes	yes
control of total FDI flow	yes	yes	yes	yes	yes
Observations	881	878	878	878	878
Number of countries	34	34	34	34	34

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All columns report results from a fixed effects poisson regression. Dependant variable is the total FDI flows that year (in that sector) that goes into country. All explanatory variables are lagged by one year and weighted by their standard deviations. The sample is restricted to countries that changed level of executive constraints between high and low executive constraints once and excludes the Lebanon. "D=1000" means that the prior is given a weight equivalent to 1000 country/year observations. This implies that the growth history of the country receives very little weight. "D=2" means that the prior is given a weight equivalent to 2 country/year observation. This gives most weight to the country-specific history. We set beta=0.66 and eta=0.75.

Table A6: Sample Robstness, Country Level

	(1)	(2)	(3)	(4)
	whole sample	only transitions	only transitions, drop Lebanon	only permanent transitions to strong
	Updating on Country Data (D = 100)	Updating on Country Data (D = 100)	Updating on Country Data (D = 100)	Updating on Country Data (D = 100)
VARIABLES	Investment Inflow	Investment Inflow	Investment Inflow	Investment Inflow
variance of productivity growth (estimated on country level)	-60.97	-109.1***	-116.9***	-153.8***
	(42.95)	(26.57)	(25.11)	(21.70)
mean productivity growth (estimated on country level)	81.33*	101.9***	107.0***	126.6***
	(45.76)	(21.61)	(20.88)	(21.20)
country fixed effects	yes	yes	yes	yes
control of total FDI flow	yes	yes	yes	yes
Observations	3,817	905	878	430
Number of countrysectorid	152	35	34	17

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All columns report results from a fixed effects poisson regression. Dependant variable is the total investment flows that year that goes into country. All explanatory variables are lagged by one year."D=100" means that the prior is given a weight equivalent to 100 country/year observations. We set beta=0.66 and eta=0.75. Note that we report unweighted coefficients so that the size of the coefficient is not comparable across columns.

Table A7: Counterfactual FDI Flows (Permanent Adopters of Strong Constraints)

	(1)	(2)	(3)	(4)	(5)	(6)
			adoption of strong constraints without change in mean productivity growth		adoption of strong constraints without change in variance of productivity growth	
		(I)	(II)	ln(II)-ln(I)	(III)	ln(III)-ln(I)
country	mean yearly investment inflows	fitted value of investment inflows	simulated fitted value of investment inflows	effect of change in mean on inflow	simulated fitted value of investment inflows	effect of change in variance on inflow
Albania	82,958	81,521	41,283	**68%**	22,922	**127%**
Botswana	11,054	12,720	38,379	**-110%**	722	**287%**
Bulgaria	330,221	310,350	720,426	**-84%**	258,979	**18%**
Chile	594,719	600,461	300,668	**69%**	39,159	**273%**
Croatia	586,062	600,538	366,180	**49%**	23,341	**325%**
Greece	1,025,297	1,026,577	1,243,009	**-19%**	199,089	**164%**
Hungary	2,271,429	2,216,808	3,331,223	**-41%**	1,133,960	**67%**
Kenya	127,670	133,066	113,287	**16%**	90,745	**38%**
Macedonia	15,236	15,019	9,355	**47%**	2,098	**197%**
Mongolia	457	431	678	**-45%**	272	**46%**
Nicaragua	11,369	12,709	11,196	**13%**	24	**625%**
Poland	3,700,832	3,677,831	2,711,260	**30%**	786,285	**154%**
Romania	3,309,029	3,079,418	3,184,507	**-3%**	713,134	**146%**
Slovakia	1,185,843	1,190,642	1,099,440	**8%**	102,412	**245%**
Taiwan	1,503,181	1,563,186	3,459,204	**-79%**	736,764	**75%**
Turkey	1,342,450	1,341,725	1,369,104	**-2%**	510,884	**97%**
Uruguay	193,514	194,828	139,744	**33%**	43,542	**150%**
			AVERAGE:	**-3%**	**AVERAGE:**	**179%**

Notes: All inflows are average yearly inflows during strong executive constraints (in 1000 EUR). "mean yearly inflows" is the actualy average yearly inflow of investment into the country. "fitted value of investment inflows" is the fitted value from Table 4, Column (4), Panel B. "simulated fitted value of investment inflows" replaces the mean (in (II)) and the variance (in (III)) in the episode with strong executive constraints with the average mean and variance in the episode with weak executive constraints. The difference between (I) and (II) ((III) respecitvely) captures the effect of changes in the expected mean (variance) on investment inflows in the model.

Figure A1: Share of Countries with Strong Executive Constraints

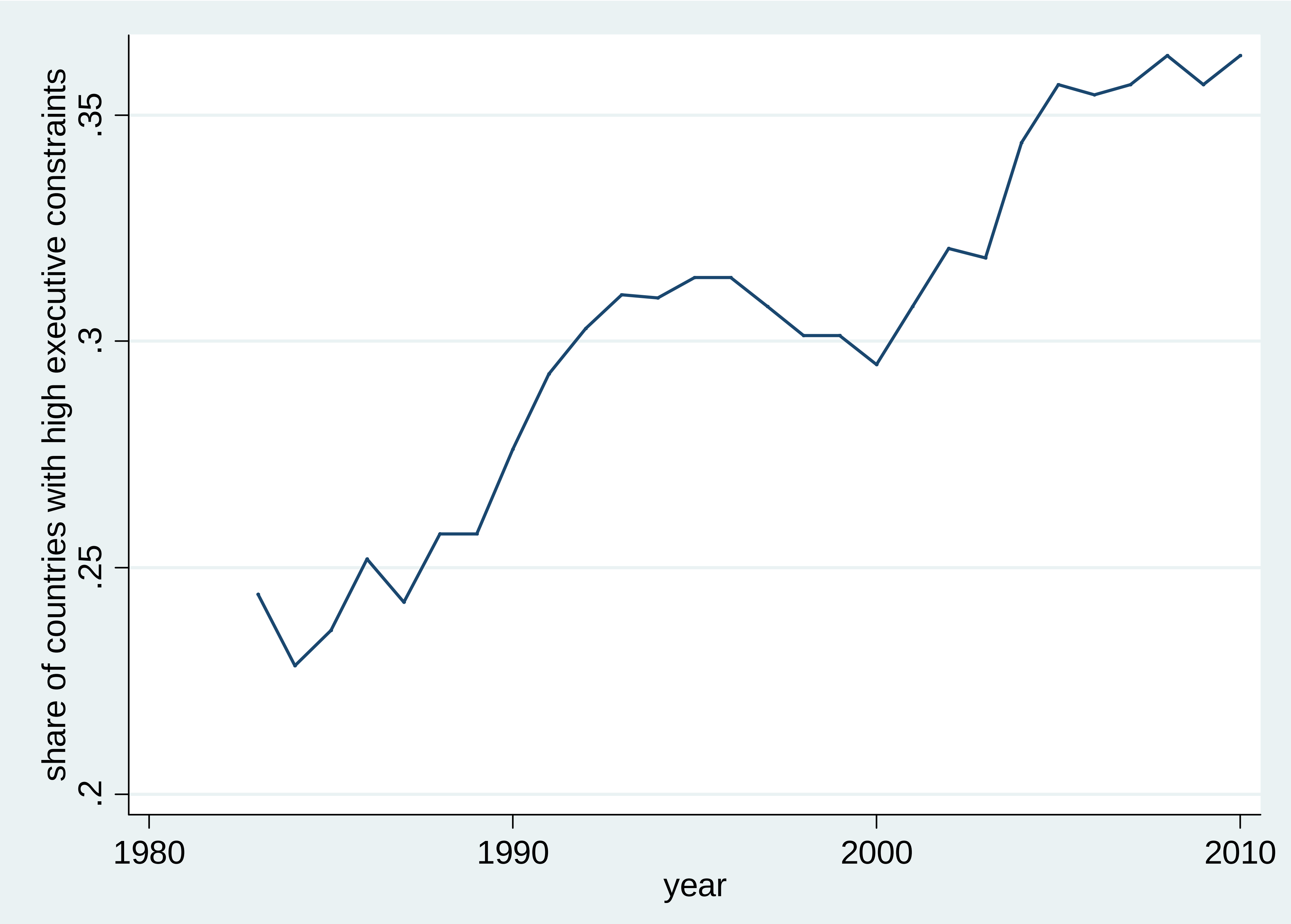
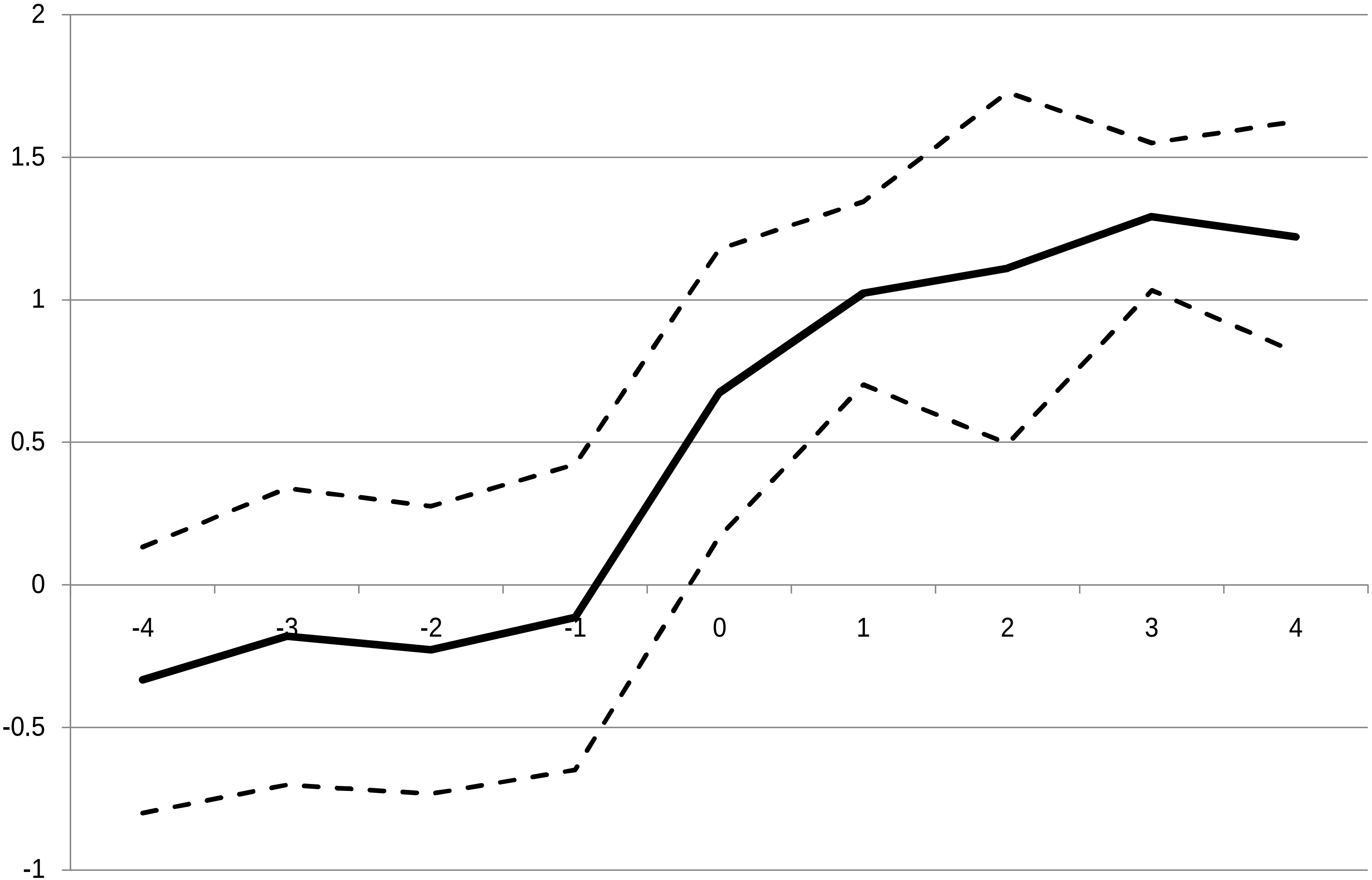


Figure A2: Adoption of High Executive Constraints and OECD Investment Flows



Solid line shows coefficients on leads and lags around the adoption date (at 0) of high executive constraints plus the coefficient on the "high executive constraints" dummy. Dashed lines show 95% confidence intervals using the standard deviation of the lead and lag coefficients.

Figure A3: World Belief of Standard Deviation

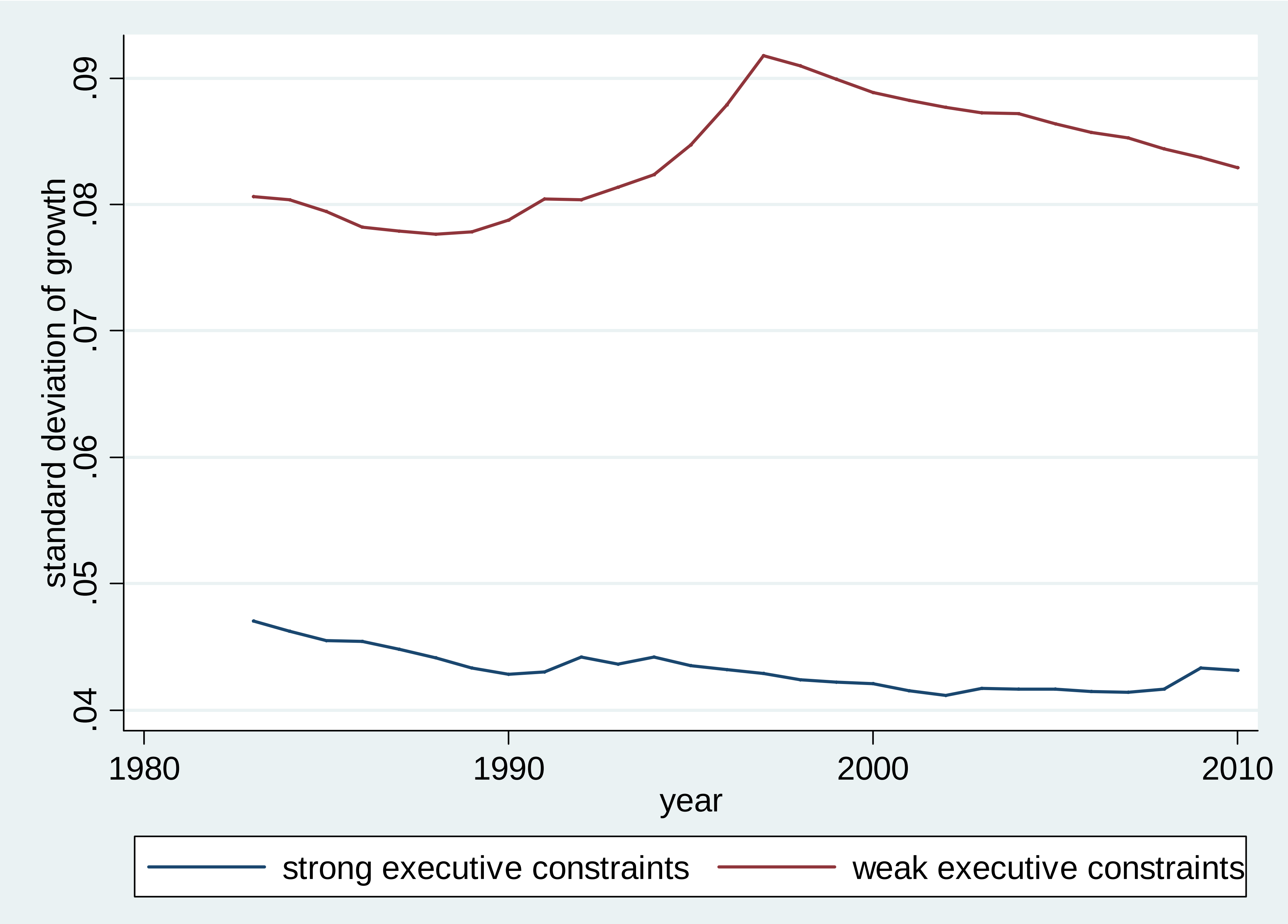


Figure A4: Executive Constraints, Stability and Foreign Investment – D=10 (including Lebanon)