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THE POLITICS OF FDI EXPROPRIATION

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ABSTRACT

I examine the role of political instability as a potential explanation for the lack of capital flows from rich countries to poor countries (i.e. the `Lucas Paradox'). Using panel data from 1984 to 2014, I document the following: (i) developed countries exhibit larger inflows of foreign direct investment (FDI), (ii) countries subject to high investment risk are those that typically receive low FDI inflows, and (iii) investment risk is generally higher in fractionalized and politically unstable economies. These findings suggest a negative relationship between political instability and FDI through the investment risk channel. I then inspect the theoretical mechanism using a dynamic political-economy model of redistribution, wherein policymakers have access to an expropriation technology that can be used to extract resources from foreign investors. The proceeds are used to finance group-specific transfers to domestic workers, but hinder economic growth by discouraging FDI. Different social groups compete to gain control of this instrument, but face a probability of losing power at each point in time. The greater the degree of political turnover is, the stronger the incentives to expropriate when in power. A key force driving this result is redistributive uncertainty, since there is a possibility that no transfers will be received in the future. The mechanism is supported by the finding that investment risk (a measure that captures the degree to which the extraction technology is used) is negatively related to FDI and government stability. Finally, I show that the political equilibrium exhibits over-expropriation and under-investment even when there is no political uncertainty because fractionalized societies suffer from static inefficiencies due to the presence of a common pool problem.

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1 Introduction

Even though the return of foreign direct investment is potentially large in many countries at the stage of development (for example, the opening up of Eastern Europe provided advantages to multinational firms due to the low cost of labor, low levels of capital in place, and the proximity to major markets), the flow of direct investment is heavily concentrated in a small set of countries.[1] Lucas (1990) suggested that this lack of FDI could be due to the fact that many developing countries face higher political risk than industrialized ones, but disregarded the empirical importance of political risk by focusing mostly on the pre-1945 colonial experience as case studies.[2] In this paper, I revisit his hypothesis by examining the role of political risk (due to fractionalization and/or political instability) as a potential deterrent of FDI inflows. Using panel data from 1984 to 2014, I document three stylized facts: (i) developed countries exhibit larger inflows of foreign direct investment (FDI), (ii) countries subject to high investment risk are those that typically receive low FDI inflows, and (iii) investment risk is generally higher in fractionalized and politically unstable economies. This suggests a negative relationship between political risk and FDI, through the investment risk channel.[3] I then inspect the theoretical mechanism using a dynamic political-economy model featuring a redistributive conflict between fractionalized social groups that alternate in power. The policymaker in power has access to an expropriation technology that can be used to extract resources from foreign investors which, are then transferred to local targeted groups. In equilibrium, a higher degree of fractionalization is associated with a greater use of the technology, and thus lower levels of foreign investment and growth. Fractionalization (modeled as the number of ethnic, religious, or social groups competing for power) results in inefficient expropriation for two reasons. First, because the likelihood of staying in power is smaller, making policymakers more short-sighted. Second, because the common pool problem is aggravated as the number of groups competing for transfers grows.

I consider a small open economy composed of a government, a set of multinational corporations and two types of agents: domestic workers and foreign capitalists. Multinational corporations are run by managers that hire domestic labor and combine it with capital to produce output. Managers choose investment and dividends in order to maximize the value of the firm. To highlight the effects of expropriation on FDI, I assume that shares of the multinational corporations are owned exclusively by foreign investors. Hence, reinvested earnings constitute FDI inflows to the domestic country. Firms are competitive and face investment adjustment costs (given by the cost of installing new capital), as in the standard Tobin's q model. Domestic workers belong to n social (i.e. ethnic or religious) groups that alternate in power according to an exogenous probability. Once in office, they decide how much to extract from FDI and where to transfer the resources collected. The extraction technology can be interpreted as a cost that foreigners must incur in order to gain access to the development of an investment project in the domestic market. Examples of these are investment taxes, capital controls, permits necessary to expand a factory or simply bribes.[4]

[1]The United Nations (1996) reports that 80% of the total investment flowing to developing countries in 1995 was received by 10 countries with the highest FDI.

[2]See Tornell and Velasco (1992) and Alfaro et al. (2008) for additional literature analyzing the Lucas (1990) puzzle.

[3]Consistent with this, Busse and Hefeker (2007) find that government stability is an important determinant of foreign investment flows. See also Gastanaga et al. (1998), Janerba (2002) and Brunetti and Weder (1998) for earlier empirical literature linking political risk to FDI.

[4]The financial crisis of 2001-2002, with the imposition of the 'corralito' in Argentina provides a good example: the government restricted capital transactions and "pesified" contracts and financial assets. For-

When a group is in power, it chooses policy (i.e. the fraction to be expropriated) while taking into account how this will affect future production and growth—via reductions in FDI— as well as the effects on the level of expropriation that other groups may choose in the future. A balanced-growth Markov-perfect equilibrium (BG-PMPE) is characterized, where variables grow at a constant rate and policy is a function of the only payoff relevant variable: foreign capital installed in the country. I focus on symmetric MPE because all groups are assumed to be identical, so the identity of the group in power is irrelevant on the determination of policy. It is important to note that this equilibrium concept rules out reputation mechanisms, and it constitutes a lower bound for the set of potential sub-game perfect equilibria that would arise in this environment. The choice of this equilibrium concept is made not only because it allows for a simple characterization, but because it does not require strong assumptions about the feasibility of punishment strategies. For example, it would be possible to attain higher welfare by inducing lower expropriation rates under the threat of financial autarky (as in Aguiar and Amador, 2011), but it is not clear that this would be in the best interest of foreign investors (i.e. share-holders) ex-post due to the large costs associated with installing and dis-installing capital.

The main mechanism explaining the negative relationship between FDI and political risk rests on the assumption that groups compete to receive transfers and derive no utility if resources are distributed to other groups. So when a given group is in power, it will balance the government budget by making transfers only to its own type or region. This introduces a common pool problem, as the benefits from expropriation are enjoyed by the group in power, whereas the costs are paid by all members of society. Relative to a planner's (constrained-efficient) allocation, fractionalization results in over-expropriation. This static inefficiency would arise even with no political turnover (e.g. under a dictator in power forever). A second source of inefficiency stems from redistributive uncertainty, as the incumbent group may lose power next period with some probability—in which case they receive no transfers. The cost associated with high expropriation rates (e.g. a smaller 'expropriation base' next period) is lower on expectation than it would be under a dictator, whereas the benefits are the same. Hence, the degree of inefficiency is larger when groups are subject to political uncertainty. Due to these two effects, and given the assumptions of the model, the political equilibrium exhibits inefficiently low inflows of FDI in fractionalized and politically unstable economies. This hinders the production capabilities of the country, reduces both growth and the overall level of welfare. To evaluate the relative importance of these distortions, I consider changes in both fractionalization (e.g., number of groups), and incumbency advantage (e.g., ability of the incumbent group to remain in power regardless of the number of groups). I show in a numerical example that while both result in inefficient expropriation levels, the effects of fractionalization are stronger. This happens because incumbency advantage only affects expropriation by lowering the expected benefits from keeping FDI undistorted—through lower political turnover—whereas fractionalization also affects the relative size of current transfers, aggravating the common pool problem. Finally, I show that greater political instability—due either to fictionalization or incumbency advantage—is associated with stronger incentives to expropriate, and hence lower levels of foreign direct investment.

eign firms' funds were forcedly converted into Pesos, and many contracts, especially in infrastructure, were rewritten or canceled. At the same time, capital was not allowed to leave the country (hence the name 'corralito,' which means 'little-fence'). Janeba (2002) provides some other examples, such as China's 1195 announcement of the scrapping of various benefits that foreign firms received in the form of exemptions from custom duties or tax rebates when using local materials.

The paper is organized as follows. The next section summarizes the connections with the literature. Section 2 describes the empirical evidence supporting the main hypothesis of the paper. Section 3 presents the environment, while Section 4 defines and characterizes the political equilibrium. Finally, Section 5 concludes.

Related Literature

Eaton and Gersovitz [1984] developed one of the most influential articles on expropriation theory. They analyzed sustainable equilibria in a static environment, and showed that even though no expropriation occurs in equilibrium, the international allocation of capital is distorted. Thomas and Worral [1994] extended this idea to an infinite-horizon economy and characterized the set of self-enforcing agreements between the host government and a multi-national corporation. Building on their work, Aguiar and Amador [2011] showed how political uncertainty could impact international capital flows. Because both the focus and economic environment studied in Aguiar and Amador [2011] are closely related to the one in this paper, it is worth pointing out some of their main differences.

First, the object of interest is different, as they focus on domestic capital whereas I analyze foreign direct investment. An important value added by this paper is precisely documenting the empirical relationship between FDI and political instability in a large set of countries.

Second, the source of the dynamic inefficiency in Aguiar and Amador [2011] is debt overhang: absent a large stock of initial debt, the government would not need to distort capital in order to face interest payments, and the first best would be reached immediately and sustained forever after. In this paper, to emphasize the role of fractionalization, debt is always zero (that is, I assume a balanced budget). The inefficiency arises due to a redistributive conflict, more in line with that in Tornell and Velasco's [1992] tragedy of the commons in which a large number of groups would like to gain access to the expropriation technology in order to divert resources to themselves through targeted transfers. This friction causes static inefficiencies—incentives to over-expropriate—even if policymakers are as patient as agents and do not face re-election uncertainty (although, as shown in the paper, inefficiencies are exacerbated by impatience and political instability). As a result, the politico-equilibrium is always inefficient in my paper.

This touches upon a third important difference. In Aguiar and Amador's [2011] paper, while political frictions slow down capital accumulation and growth during the transition, the inefficiency eventually vanishes. That is, in the long run the economy converges to the first best in their work. In this paper, the economy is inefficient along the balanced-growth path and never reaches the first best. This is not only the result of the static common pool problem mentioned above, but also due to the fact that our solution concepts are radically different. While Aguiar and Amador characterize self-sustaining equilibria, I focus on Markov-perfect equilibria instead. As mentioned in the introduction, this concept was chosen because, given the structure of the model, a threat such as financial autarky would not be appealing due to the existence of adjustment costs of capital and the fact that shareholders are dispersed (that is, they are not likely to be able to force a corporation of which they hold an infinitesimal share to leave the country forever after a small deviation). It would be interesting to consider self-sustaining equilibria where groups could revert back to the BG-MPE, but that is beyond the scope of this paper and it is deferred to future work.

Finally, the behavior of policymakers in Aguiar and Amador [2011] is similar to that of a quasi-hyperbolic (or quasi-geometric) agent in Laibson [1997] (see also Halac and Yared

[2014] for a similar environment). This results from the assumption that groups place a higher weight on consumption when in power than when out of power. Higher political turnover affects the effective discount factor, making policymakers de-facto more impatient than agents, and hence always results in more under-investment on the transition path in their model. The mapping between effective discount factors and incumbency advantage breaks in this paper because the continuation utility takes a different form when groups are out of power, as they receive no transfers but are still affected by production. This implies that the dynamic consequences of excessive expropriations when a group is out of power are valued differently than when the group is in power. Moreover, the relative marginal value of a unit of capital in the two cases can be affected by policy. So even though higher turnover induces myopia due to the 'effective discount factor effect' as in their model, it also changes the relative value of the associated distortion: I call the 'value of a dollar effect.' As a result, and similarly to Acemoglu, Golosov, and Tsivinski [2011], the probability of power switches does not map one to one with the effective discount factor. To illustrate this, I show an example in which expropriation rates are completely irresponsive to changes in political turnover. I also show that this is a knife-edge case, and provide numerical examples in which higher political stability is associated with better outcomes (e.g. lower expropriation rates). Acemoglu, Golosov, and Tsivinski [2011], on the other hand, find that more persistence typically worsens outcomes. The difference in our findings arises from the fact that they focus on self-sustainable equilibria whereas I restrict attention to Markovian ones. Given the negative correlation between political stability and investment risk documented in this paper, the positive implication of my model seems more in line with the data.

By focusing on this particular equilibrium concept, this paper contributes to a growing literature characterizing Markov Perfect equilibria under political frictions, following the pioneering work of Klein, Krusell and Rios Rull [2008]. Examples are Azzimonti, Sarte, and Soares [2009], Debortoli and Nunes [2010], Ilzetzki [2011], Klein and Rios-Rull [2003], Martin [2010, 2015], Ortigueira [2006] in closed economy environments, and Quadrini, [2005] in open economies. More generally, it is related to the political macroeconomics literature analyzing the impact of political uncertainty on government policy in dynamic environments. Azzimonti [2011] and Azzimonti and Talbert [2014] show that political turnover can negatively affect capital accumulation, whereas Amador [2004] points out its effects on public debt. Caballero and Yared [2010] emphasize how a government's myopic behavior in the presence of political risk results in over-indebtedness. Battaglini and Coate [2007, 2008] find similar inefficiencies in a dynamic bargaining model. The underlying force driving the inefficiency of policy in all of these papers is the uncertainty surrounding the identity of tomorrow's policymaker, a channel that was first pointed out by Alesina and Tabellini [1990] and Besley and Coate [1998]. Most of these papers, by restricting attention to closed economies, ignore the effects of political frictions on capital flows, and particularly FDI, which are the focus of this paper.

Finally, this paper is related to the literature analyzing how weak institutions (i) deter investment and the adoption of new technologies (Parente and Prescott, [2000]), (ii) explain differences in income per-capita (Acemoglu et al., [2001], [2002] and Acemoglu and Johnson, [2005]), (iii) relate to fiscal capacity (Besley, Ilzetzki, and Persson, 2013).

2 Empirical Evidence

In this section, I analyze the relationship between FDI and Investment Risk (IR). I then show how investment risk is itself related to several measures of political instability. I use an unbalanced panel of 145 countries (listed in Appendix 6.1) over the period 1984-2014.

2.1 Variables and data sources

- *Foreign Direct Investment (FDI)* refers to direct investment equity flows in the reporting economy. It is the sum of equity capital, reinvestment of earnings, and other capital. Direct investment is a category of cross-border investment associated with a resident in one economy having control or a significant degree of influence on the management of an enterprise that is resident in another economy. Ownership of 10 percent or more of the ordinary shares of voting stock is the criterion for determining the existence of a direct investment relationship. This series shows net inflows (new investment inflows minus disinvestment) in the reporting economy from foreign investors. FDI is measured in current U.S. million dollars. Source: World Bank WDI Online.[5]

- *Foreign Direct Investment as a percentage of GDP (FDIGDP)* corresponds to net inflows (new investment inflows minus disinvestment) in the reporting economy from foreign investors (see description for FDI above), and is divided by GDP. Source: World Bank WDI Online.[6]

- *Growth* corresponds to the percentage change in annual GDP of each country. Source: World Bank WDI Online.

- *Investment risk (IR)* incorporates factors affecting the risk to investment that are not covered by other political, economic and financial risk components. The risk rating assigned is the sum of three subcomponents: Contract Viability/Expropriation, Profits Repatriation, and Payment Delays. It captures the degree by which a government might expropriate either the returns to investment made by foreign firms or part of the capital invested itself. The larger the value, the higher the risk faced by foreign investors (with a scale from 0 to 12). The variable is constructed as $IR = 12 - IP$, where IP stands for Investment Profile, obtained from the ICRG Researchers Dataset 2015 distributed by PRS Group.

- *Government Stability (GS)* is an assessment both of the government's ability to carry out its declared programs and its ability to stay in office. The risk rating ranges from 0-12, with 12 indicating the most stable and is calculated by ICRG. The index corresponds to the sum of three subcomponents: Government Unity, Legislative Strength,

[5]FDI is based on data obtained from International Monetary Fund, Balance of Payments database, supplemented by data from the United Nations Conference on Trade and Development and official national sources. Series available at http://data.worldbank.org/indicator/BX.KLT.DINV.CD.WD

[6]FDIGDP is based on data obtained from International Monetary Fund, International Financial Statistics and Balance of Payments databases, World Bank, International Debt Statistics, and World Bank and OECD GDP estimates. Series available at http://data.worldbank.org/indicator/BX.KLT.DINV.WD.GD.ZS

and Popular Support.[7] Source: ICRG Researchers Dataset 2015 distributed by PRS Group.

- *Internal Conflict (IC)* is an assessment of political violence in the country and its actual or potential impact on governance. We normalize the series such that the lowest rating, 0, is given to those countries where there is no armed or civil opposition to the government and the government does not indulge in arbitrary violence, direct or indirect, against its own people. The highest rating of 12 is given to a country embroiled in an on-going civil war. The risk rating assigned is the sum of three subcomponents: Civil War/Coup Threat, Terrorism/Political Violence, and Civil Disorder.
- *External Conflict (EC)* is an assessment both of the risk to the incumbent government from foreign action, ranging from non-violent external pressure (diplomatic pressures, withholding of aid, trade restrictions, territorial disputes, sanctions, etc) to violent external pressure (cross-border conflicts to all-out war). External conflicts can adversely affect foreign business in many ways, such as restrictions on operations, trade and investment sanctions, ,distortions in the allocation of economic resources, and violent change in the structure of society. The variable is defined between 0 and 12, with the highest score indicating very high risk. The variable is the sum of three subcomponents: War, Cross-Border Conflict, and Foreign Pressures.
- *Religious tensions (RT)* may stem from the domination of society and/or governance by a single religious group that seeks to replace civil law by religious law and to exclude other religions from the political and/or social process, the desire of a single religious group to dominate governance, the suppression of religious freedom, and the desire of a religious group to express its own identity or separate from the country as a whole. The risk involved in these situations ranges from inexperienced people imposing inappropriate policies through civil dissent to civil war. The variable is defined between 0 and 6, with the highest score indicating very high risk.
- *Ethnic Tensions (ET)* is an assessment of the degree of tension within a country attributable to divisions associated with race, nationality, or language. Lower ratings are given to countries where racial and nationality tensions are high because opposing groups are intolerant and unwilling to compromise. The variable is defined between 0 and 6, with lower ratings given to countries in which tensions are minimal, even though such differences may still exist.

2.2 Stylized Facts

The stylized facts are described below. The focus is on four sets of countries, grouped by regions: OECD, East Asia, Latin America, Africa, and Other. The list of countries included in each region can be found in Appendix 6.1.

1. ***Developed countries receive larger inflows of FDI on average.***

   The average amount of FDI (in millions of US dollars) for the period 1984-2014 in the different regions is presented below, with the annual growth rate of their GDP over

[7] Precise definitions can be found at the 'International Country Risk Guide,' published by the PRS Group.

the same period. We can see that developed countries (e.g. OECD) grow at a lower rate but receive much larger FDI inflows on average.

Table 1: FDI and Growth

Region	FDI	Growth
OECD	$26,971	7.1%
East Asia	$11,892	8.9%
Latin America	$3,825	8.0%
Africa	$568	7.8%
Other	$2,440	8.9%

Note: Average values per region between 1984-2014. Countries included in each region are described in Appendix 6.1. FDI is in millions of US dollars, and growth rates are in percentage terms.

These values are surprising due to the fact that OECD countries have a larger stock of already-installed capital. Assuming a standard production function, where the marginal return of capital is decreasing, we would expect larger flows of FDI to developing countries. Lucas (1990) made this point using a simple Cobb-Douglas technology: the marginal product of capital in India should be 58 times larger than in the US, yet capital does not flow to India. One of the explanations proposed by Lucas behind the lack of FDI flows towards developing economies could be the instability in their political environment. The next set of facts provides some evidence that supports this hypothesis.

2. ***Foreign Direct Investment is lower in countries with larger Investment Risk (IR)***.

Because FDI is measured in current dollars, and factors such as inflation and growth may affect the behavior of the time series, I use FDI as a percentage of GDP in this section. The scatter-plot in Figure 1 shows a negative relationship between FDI (as a percentage of output) and investment risk, indicating that foreigners are reluctant to invest in countries where the government uses the expropriation technology extensively.

The region-specific correlation coefficients are presented in the following table.

Table 2: Correlation between Investment Risk and FDI as a percentage of GDP

Region	Correlation
OECD	−0.16
Latin America	−0.39
East Asia	−0.39
Africa	−0.09
Other	−0.26

Emerging economies (i.e. those in Latin America and East Asia) have a similar correlation coefficient of −0.39, whereas the coefficient is negligible in African countries. Note, however, that FDI inflows to African countries are very small on average (see Table 2).

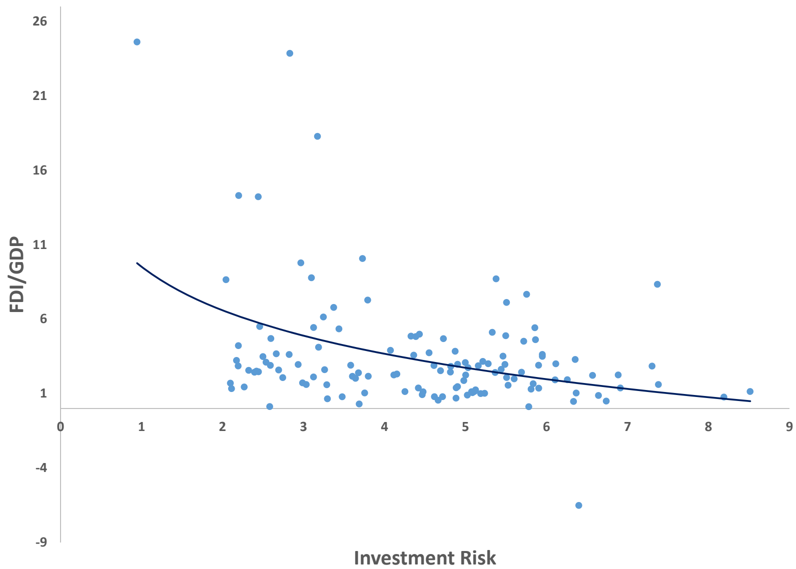

Figure 1: FDI/GDP as a function of Investment Risk (average values between 1984-2014 per country).

In order to determine whether the negative correlation between FDI and investment risk is statistically significant, I compute a fixed-effects regression of the form

$$FDIGDP_{it} = \alpha_i + \gamma_t + \beta IR_{it} + \epsilon_{it}$$

where $FDIGDP_{it}$ denotes FDI inflows as a percentage of GDP in country i at year t, IR_{it} represents investment risk for the same country-year pair, and ϵ_{it} represents an error term. The variable α_i denotes country-specific fixed-effects, in order to control for time-invariant country characteristics, whereas γ_t denotes time fixed-effects, in order to control for aggregate factors that may have affected FDIGDP at particular points in time. The results are summarized column (1) of Table 3. Standard errors clustered by country and corrected for autocorrelation and heteroscedasticity are reported in parenthesis.

The negative relationship between FDI and investment risk is statistically significant, as suggested by a p-value of 0.02. A value of -0.31 indicates that when IR increases by 1 point, FDI as a percentage of GDP declines by 0.3 points when all countries in the sample are considered. This relationship is mostly driven by non-OECD countries as a comparison of the coefficients in Specifications 2 and 3 in Table 3 reveals: the relationship between the two variables is statistically insignificant in OECD countries. When emerging and developing economies are considered (e.g. only non-OECD countries) the estimated coefficient $\beta = -0.41$ is larger than it is for the whole sample, $\beta = -0.31$.

Table 3: Fixed-effects regression, FDIGDP and IR

Dep. Var: FDIGDP	All (1)	OECD (2)	Non-OECD (3)	Non OECD/Africa (4)
Investment Risk (IR)	-0.31**	0.1	-0.41**	-0.65***
	(-2.34)	(0.34)	(-3.01)	(-3.21)
Observations	3,554	676	2,908	1,932
R-squared	0.25	0.52	0.19	0.23
Number of Countries	134	24	111	76

Notes: Sample period 1984-2014. The dependent variable in Specification (1) is $FDIGDP_{it}$, the independent variables are investment risk IR_{it}, time fixed-effects, and country fixed-effects. Specification (2) includes only OECD countries, whereas Specification (3) excludes OECD countries, Specification (4) excludes both African and OECD countries. Robust standard errors (corrected for autocorrelation and heteroscedasticity), clustered by country, are shown in parentheses. Significance denoted as: *** p<0.01, ** p<0.05, * p<0.1

Because the relationship between IR and FDI is negligible in African countries (see Table 2), I re-computed the fixed-effects regression excluding these countries in Specification (4). The results are shown in the last column of Table 3. The coefficient is now much larger, $\beta = -0.65$ (with a p-value of 0.002), suggesting that IR is detrimental to FDI inflows in emerging economies, but less so in African countries. To put this number in perspective, recall that IR ranges from 0 to 12 with an average value of 4.4, whereas average FDIGDP is 3.5. Thus an increase in IR of 10% from its average value results in an average decline of foreign investment of 8.17% per year in non-OECD/non-African countries.[8]

3. ***There is lower investment risk in countries that are more politically unstable.***

The ICRG Researchers Dataset has several measures that attempt to capture political instability. For example, low values of 'Government Stability' indicate that the government is unlikely to carry out its proposed plans or even stay in office. Countries under internal conflict (armed or civil opposition to the government) or external conflict (cross-border disputes or wars) are also politically unstable. Finally, political instability may arise due to ethnic or religious tensions among different groups in the population. All of these, by affecting political turnover and the nature of redistributive policies, are likely to impact investment risk, and hence the returns to FDI.

Because the countries in our sample may face one or more political instability factors, the analysis will consider the effects of these factors separately. I will first present the region-specific correlations between investment risk and political instability, and then a regression analysis to test whether the correlations are statistically significant.

[8]This is computed as follows. A 10% increase in IR corresponds to $0.1 \times 4.4 = 0.44$. The effect of this change is a $-0.65 \times 0.44 = -0.286$ point decline in FDI as a percentage of GDP, which corresponds to a decrease of $3.5/0.286 = 0.0817$, or 8.17%, from its average value.

Table 4: Correlation between investment risk and political instability

Risk/Region	OECD	East Asia	Lat America	Africa	Other
Government Stability	-0.48	-0.44	-0.51	-0.59	-0.47
Internal Conflict	0.03	0.38	0.45	0.46	0.36
External Conflict	-0.17	0.24	0.42	0.35	0.24
Religious Tensions	0.04	0.29	0.32	0.18	0.11
Ethnic Tensions	-0.21	0.45	0.12	0.31	0.15

There is a strong negative correlation between government stability and the risk of expropriation across regions. This indicates that countries where political turnover is high are more likely to engage in expropriation activities. We can also see that internal and external conflicts increase expropriation risk in all regions but OECD countries. Religious tensions seem more relevant in Latin America and East Asia, whereas ethic tensions are strongly correlated with investment risk mostly in East Asia and Africa. Religious and ethnic tensions, which we will refer generically to as *fractionalization*, are likely to affect not only political turnover but also the redistributive base (e.g. the number of groups receiving transfers) and hence the incentives to expropriate. Because the different sources of political instability may interact with each other, it is important to consider their effect simultaneously. To do this, I compute a fixed-effects regression of the following form

$$IR_{it} = \alpha_i + \gamma_t + \beta_1 GS_{it} + \beta_2 IC_{it} + \beta_3 EC_{it} + \beta_4 RT_{it} + \beta_5 ET_{it} + \epsilon_{it},$$

where IR_{it} denotes investment risk in country i at year t, GS stands for Government Stability, IC for internal conflict, EC for external conflict, RT for religious tensions and ET for ethnic tensions. Country-fixed effects are represented by α_i, time fixed-effects by γ_t, and the error term by ϵ_{it}.

Among the political instability factors, government stability, internal conflict, and religious tensions seem to be the most significant determinants of investment risk. This is the case when considering all countries in our sample (see Specification 1 in Table 5), as well as when considering a subset excluding developed ones (see Specification 2). Overall, the empirical findings suggest that countries exhibiting greater political instability tend to suffer higher expropriation risk of foreign direct investment.

Summarizing, the stylized facts above suggest that there is a positive relationship between political instability and expropriation risk. This could discourage inflows of FDI despite the fact that the marginal productivity of capital is potentially larger in developing countries. The model below rationalizes these findings and points to a redistributional conflict as the main cause of excessive expropriation in politically unstable economies.

3 Environment

This small open economy is composed of a government, a set of multinational corporations, and two types of infinitely lived agents: domestic workers and foreign capitalists. Domestic workers belong to one of n social (e.g. ethnic or religious) groups, which alternate in

Dep. Var: IR	All (1)	Non-OECD (2)
Government Stability (GS)	-0.22***	-0.20***
	(0.035)	(0.037)
Internal Conflict (IC)	0.095**	0.12***
	(0.044)	(0.044)
External Conflict (EC)	-0.049	-0.025
	(0.038)	(0.042)
Religious Tensions (RT)	0.18**	0.18**
	(0.081)	(0.078)
Ethnic Tensions (ET)	-0.02	0.10
	(0.094)	(0.10)
Observations	3,554	2,908
R-squared	0.33	0.3
Number of Countries	134	111

Notes: Sample period 1984-2014. The dependent variable in Specification (1) is IR_{it}, the independent variables are GS, IC, EC, RT, ET, time fixed-effects, and country fixed-effects. Specification (2) excludes OECD countries, and Specification (3) excludes both African and OECD countries. Robust standard errors (corrected for autocorrelation and heteroscedasticity), clustered by country, are shown in parentheses. Significance denoted as: *** p<0.01, ** p<0.05, * p<0.1

Table 5: Fixed-effects regression, IR and political instability

power stochastically and determine government policy. Hence, the domestic economy is fractionalized and subject to political instability. To highlight the effects of expropriation on FDI flows, it is assumed that firms are owned by foreign investors. Hence, reinvested earnings (i.e. earnings not distributed as dividends) constitute FDI inflows to the domestic country. The government has access to an expropriation technology that allows it to extract a proportion of foreign direct investment at each point in time. The expropriation rate chosen by the government in period t is denoted by θ_t. The proceeds are used to finance group-specific transfers to domestic workers. These transfers are the source of redistributive conflict across social groups.

Technology There is one consumption good produced by identical competitive firms, the *multinational corporations*. Following Eaton and Gercovitz (1984), I assume that 'managerial services' are the intangible assets that foreign firms bring to the production process such as organizational skills, technological knowledge, access to overseas markets, etc. The main difference between managerial skills and physical capital is that the former cannot be expropriated by the government. More importantly, if expropriation occurs, the managerial services of the foreign manager are no longer available for production. This implies that any capital expropriated by the government becomes unproductive either because the domestic worker does not have the necessary skills to run production by himself or because the capital installed by the foreign investor was specific to the manager's skills. Therefore, capital cannot be used to produce using the foreign technology.

Firms produce using a constant returns to scale technology $F(k_t, z_t)$, where k_t is physical capital in productivity units and $z_t = H_t L_t$. Here, H_t is an index of knowledge or human capital, and L_t denotes the total number of hours worked. Under this specification, additions of human capital act as an externality in the production of firms, entering as Harrod-neutral technological progress. The capital stock follows

$$k_{t+1} = I_t + (1-\delta)k_t,$$

where δ denotes the depreciation rate of k_t and I_t denotes investment used for both increases in physical capital and activities which improve on the quality of capital (e.g. research and development). While investment becomes productive instantaneously (that is, there are no delivery or time-to-build lags), the firm faces adjustment costs of investment, which are given by the function $D(I_t, k_t)$.

Assumption 1 *Adjustment costs are increasing and convex in investment, $D_I > 0$ and $D_{II} > 0$. The costs of installing new capital are decreasing in the existing stock of capital $D_k < 0$.*

They can be interpreted as costs of installation and de-installation of capital (with the marginal cost being an increasing function of the rate at which investment takes place) or diminishing returns in research activities.

Following Arrow (1962) and Romer (1986), knowledge is assumed to grow proportionally and as a by-product of the accumulation of investment and research activities in the economy,

$$H_t = K_t,$$

where K_t denotes the average capital stock across firms (I assume that there is a measure 1 of firms, so K_t denotes aggregate capital as well). This externality allows for the possibility of growth in the economy.

Foreign Capitalists Foreign capitalists are infinitely lived and have standard increasing and concave preferences over consumption $u(c_{kt})$, which are additively separable over time. Their lifetime utility is

$$\sum_{t=0}^{\infty} \beta^t u(c_{kt}),$$

where $\beta \in (0,1)$ denotes their discount factor. Each period, they can trade shares of the firm operating in the domestic market. I denote by s_t the number of shares held at the beginning of period t. The ownership of shares entitles the shareholder to a dividend per share of d_t, and shares can be traded at the competitive price p_t. Capitalists also own a risk-free asset B_t that pays a return $1 + r^*$, where r^* denotes the world interest rate. Their budget constraint is

$$c_{kt} = s_t(p_t + d_t) + (1 + r^*)B_t - p_t s_{t+1} - B_{t+1}.$$

Multinational Corporations Because $F(k_t, H_t L_t)$ has constant returns to scale, we can focus on a representative multinational corporation. The representative firm owns capital k_t installed in the home country, hires domestic workers, and combines these two inputs to produce consumption, taking H_t as given.

The total number of shares is normalized to one. The firm has no access to additional sources of external finance (i.e. it cannot issue new equity or debt). Hence, wages, investment, and the distribution of dividends to shareholders must be financed exclusively using internal funds. The firm's financing constraint reads

$$F(k_t, H_t L_t) = d_t + w_t L_t + I_t(1 + \theta_t) + D(I_t, k_t).$$

The firm's objective is to maximize its market value v_t. Since owning shares gives shareholders the right to collect dividends d_t and the possibility of re-selling their shares, the value of the firm is

$$v_t = p_t + d_t.$$

Domestic workers Domestic workers supply labor inelastically at the competitive wage rate w, have no international mobility, and belong to one of n social groups. A group can be interpreted as a collection of individuals residing in one of n districts, or as sharing a common language, ethnicity, or religious belief. Agents are identical, so for symmetry it will be assumed that there is a measure $1/n$ of individuals in each group or district (and hence a measure 1 of domestic agents). Their lifetime utility is given by

$$\sum_{t=0}^{\infty} \beta^t u(c_{jt})$$

where $\beta \in (0, 1)$ is the discount factor and $u(c_{jt})$ is an increasing and concave function satisfying standard Inada conditions. The consumption of a domestic worker belonging to group j is denoted by c_{jt} and satisfies

$$c_{jt} = w_t + T_{jt}.$$

Two things from this specification are worth noticing. First, the only source of heterogeneity across workers is given by the level of group-specific transfers received from the government, denoted by T_{jt}. Second, they do not have access to capital markets, so their assets equal zero at all times. This simplifying assumption is made to reduce the dimensionality of the problem, and acts as a proxy for the case of developing economies where FDI is the main driving force of production and domestic investment is negligible.[9]

Government The government expropriates a proportion of FDI and distributes the proceeds between agents belonging to different social groups. Assuming that it must balance its budget (e.g. cannot issue debt), the government's budget constraint is

$$\sum_{j=1}^{n} \frac{1}{n} T_{jt} = \theta_t I_t.$$

[9]For example, the ratio of Inward FDI / Gross Fixed Investment in Bolivia is about 45% while Inward FDI / Domestic Savings is 69.22 %. The numbers for Hong Kong are 59.24% and 51.53%, and 46.77% and 28.03%for Singapore. Finally, FDI / Domestic Savings is 171.1% for Nicaragua .

Recall that T_{jt} denotes per-capita lump-sum transfers received by each agent in group j, so $\frac{1}{n}T_{jt}$ is the total amount of transfers that the group as a whole receives from the government.

Since transfers can be targeted at specific social groups, it is reasonable to expect each group to exert effort in order to obtain them. Rather than explicitly modeling political turnover, and following Aguiar and Amador (2011) or Acemoglu, Golosov, and Tsyvinski (2011), I assume that groups alternate in power stochastically according to a Markov process. The probability that a given incumbent group remains in power is denoted by p and satisfies

$$p = \frac{1}{n} + \xi,$$

where $\xi > 0$ represents incumbency advantage. This specification implies that countries with higher political instability (i.e. those with low p) will be those where incumbents have low incumbency advantage ξ or where there is a high degree of fractionalization, i.e. where there is a large number of ethnic or religious groups n competing for power. Conditional on the incumbent losing office, the probability that any opposition group gains control of the government, denoted by q, is symmetric and satisfies $q = \frac{1-p}{n-1}$. Notice that this specification allows for specifications in which groups gain control via a democratic process where parties compete for elections, as well as those in which turnover that follows from revolutions and *coups* following a non-democratic (and possibly violent) process. It is, however, consistent with several micro-founded specifications discussed in the political economy literature. For example, Azzimonti (2011) derives a similar expression for an endogenous voting model (using probabilistic voting) with $n = 2$. Battaglini and Coate (2008) consider legislators bargaining in congress over the distribution of the budget and find that their probability of being in the minimum winning coalition is constant over time. These approaches share the property that redistributive uncertainty (captured by the probability of being the decision-maker in the following period) plays a key role in the level of distortions imposed by policy.

The group in power tries to maximize the lifetime utility of individuals belonging to that group, taking into account the possibility of losing power and the actions taken by future policymakers. More details about the political game are provided in Section 4, where the political equilibrium is defined. It is worth describing the timing more formally at this point.

Timing

- At the outset of period t, group j is in power and chooses the expropriation rate θ_t.
- The multinational corporation chooses labor L_t, foreign direct investment I_t, and dividends d_t.
- The good is produced, wages are paid, and expropriation takes place. The government makes transfers T_{jt} and domestic workers consume.
- Foreign capitalists collect dividends and consume.
- A new group takes power.

Because all groups are symmetric, they choose the same level of expropriation $\theta_{it} = \theta_{jt} \equiv \theta_t$ when in power, so the economy exhibits no aggregate uncertainty.[10] Notice that given

[10]Hence, the economy is subject to political risk but not to political uncertainty, as it is in Pastor and Veronesi's (2012) paper.

the dynamic nature of the game and the timing of events, it would not be optimal for the government to expropriate at a level where investment in the country drops to zero (that is, a θ_t that drives I_t to 0). Moreover, it is not optimal for the government to expropriate the capital itself: as mentioned before, neither the government nor the domestic workers own the managerial skills needed to run the firm efficiently.[11]

3.1 The competitive equilibrium given policy

In this section, I define and characterize the competitive equilibrium given policy.

Definition 1 *A competitive equilibrium given policy* $\{\theta_t\}_{t=0}^{\infty}$ *is given by a sequence of allocations* $\{c_{kt}, \{c_{jt}\}_{j=1}^{n}, s_{t+1}, B_{t+1}, I_t, k_{t+1}, L_t, d_t\}_{t=0}^{\infty}$*, transfers* $\{\{T_{jt}\}_{j=1}^{n}\}_{t=0}^{\infty}$ *and prices* $\{p_t, w_t\}_{t=0}^{\infty}$ *such that*

- *Given prices and dividends, foreign capitalists choose* $\{c_{kt}, s_{t+1}, B_{t+1}\}_{t=0}^{\infty}$ *to maximize their lifetime utility.*
- *Given prices, multinational corporations choose capital, investment, dividends, and labor* $\{k_{t+1}, I_t, d_t, L_t\}_{t=0}^{\infty}$ *to maximize their value* $v_t = p_t + d_t$*.*
- *Given prices and transfers, the domestic worker's budget constraint holds at each t* $c_{jt} = w_t L_t + T_{jt}$*.*
- *The sequence of transfers satisfies the government budget constraint* $\sum_{j=1}^{n} \frac{1}{n} T_{jt} = \theta_t I_t$*.*
- *The labor market clears* $L_t = 1$*.*
- *The stock market clears* $s_{t+1} = 1$*.*

Foreign capitalists choose a sequence of s_{t+1} and B_{t+1} to maximize their lifetime utility. Their first order conditions deliver the no-arbitrage equation

$$\frac{p_{t+1} + d_{t+1}}{p_t} = 1 + r^*, \tag{1}$$

which implies that the return from owning shares s_{t+1} must equal the return from assets B_{t+1}. Using eq. (1), we can re-write the value of the firm $v_t = p_t + d_t$ as the present discounted sum of dividends

$$\begin{aligned} v_t &= d_t + \frac{d_{t+1}}{1+r^*} + \frac{d_{t+2}}{(1+r^*)^2} \dots \\ &= \sum_{s=0}^{\infty} \frac{d_{t+s}}{(1+r^*)^s} \end{aligned}$$

where distributed dividends correspond to the difference between earnings and investment (net of adjustment costs),

$$d_t = F(k_t, H_t L_t) - w_t L_t - I_t(1+\theta_t) - D(I_t, k_t).$$

[11] This is a simplification for a more general case where the government or members of the group in power could work as managers, but had access to an inferior technology.

Without loss of generality, and to ease notation, we can study the problem of the firm as of period 0. It's objective can be re-written as

$$\max_{\{I_t,k_{t+1},L_t\}_{t=0}^{\infty}} \sum_{t=0}^{\infty} \frac{1}{(1+r^*)^t} \{F(k_t, H_t L_t) - w_t L_t - I_t(1+\theta_t) - D(I_t, k_t)\}$$

$$\text{s.t. } I_t = k_{t+1} - (1-\delta)k_t. \tag{2}$$

Notice that firms internalize the cost of expropriation, $\theta_t I_t$, when evaluating the costs of reinvesting earnings I_t in the domestic country. Higher expropriation levels increase incentives to distribute earnings rather than investing them in the home country, and hence reduce FDI.

Consider the optimality conditions for an arbitrary t. Wages satisfy the standard marginality condition $w_t = f_L(K_t, K_t L_t)$ since $k_t = K_t = H_t$ in equilibrium. Letting q_t denote the current valued Lagrange multiplier on constraint 2, we have that

$$q_t = D_{I_t} + 1 + \theta_t, \tag{3}$$

where $D_{I_t} = D_I(I_t, k_t)$. Under the optimal plan, the firm invests such that the marginal cost of an additional unit of capital (which equals 1 plus the adjustment cost and expropriation rate) equals the shadow price of capital q_t, also known as Tobin's q. Finally, the FOC with respect to future capital is

$$q_t = \frac{1}{1+r^*}\left(f_{k_{t+1}} - D_{k_{t+1}} + (1-\delta)q_{t+1}\right), \tag{4}$$

which represents the Euler equation for the firm: the (shadow) price of capital today must equal the discounted value of the return on capital next period through higher production, the savings in adjustment costs tomorrow, and the next period's shadow price of capital (which can be obtained by selling capital tomorrow). Re-arranging expressions (3) and (4), we obtain

$$D_{I_t} + 1 + \theta_t = \frac{1}{1+r^*}\left(f_{k_{t+1}} - D_{k_{t+1}} + (1-\delta)[D_{I_{t+1}} + 1 + \theta_{t+1}]\right) \tag{5}$$

This dynamic equation determines the evolution of capital over time as a function of expropriation rates θ_t.

4 Politico-equilibrium

A group's objective is to maximize the utility of its supporters. This implies that, while they do not put any weight on the welfare of other regions or groups, policymakers are 'benevolent planners' for their own region.[12]

I assume that there is no commitment technology: once in power, the group will choose what is best for its constituency from that point on. This implies that any promises made before the political uncertainty is resolved are not credible.

[12] In the political economy literature, these policymakers are referred as *partisan*. An alternative approach, also studied in the literature, assumes that the leader's sole objective is to maximize their probability of controlling the government because he either obtains some ego-rents out of being in power or he can redistribute resources to himself (*kleptocrats*).

The representation of the maximization problem of a group in power is complex because, due to the dynamic nature of the game, it is necessary to describe how current policymakers expect future policymakers to behave. In particular, the optimal decision of policy is not only subject to how foreign investors react to the level of expropriation today, but also to how next period's government will choose to expropriate future investment and to whom they will distribute it. Since groups are forward looking, they need to predict the effects that a change in policy today will have on the whole sequence of policies in the future and internalize that the identity of the policymaker can change at each point in time (i.e. that a representative belonging to different social group might be in power tomorrow). In principle, this dynamic game allows for multiple sub-game-perfect equilibria that can be constructed using reputation mechanisms. Characterizing sustainable equilibria in this game is more involved than characterizing it in, for example, Aguiar and Amador (2011). In their economy, the policymaker's utility when out of power is proportional to the utility when in power at an exogenous rate. The nature of the equilibrium does not change the relative value of being in power to that of being out of power, and incentives are given through the threat of financial autarky. In our environment, the value of being out of power is endogenous as it depends on the level of transfers received from the opposition (if any). When constructing sustainable equilibria, this would need to be determined as part of the equilibrium, as it is an important source of incentives. For example, a policymaker may receive transfers when out of power as long as it does not deviate (see Dixit, Grossman and Gul, 2000). Moreover, there could be equilibria where some—but not all—groups engage in giving transfers to other groups out of power. The solution to the political game becomes closer to one of determining sustainable coalitions in this environment. This is an interesting avenue of research, but not the one I will follow in this paper.

I will focus on Markov perfect equilibria (MPE) instead, defined as a set of strategies that depend only on the current payoff-relevant state of the economy, K_t. This is closer to the approach in Klein, Krusell, and Rios Rull (2008) and Azzimonti (2011).

4.1 Symmetric Markov-perfect equilibria

Because groups cannot credibly promise to transfer resources to other regions in the future, it is in no group's interest to provide transfers to regions different than its own once in power. Mathematically, this implies that group j will optimally set

$$T_{st} = 0 \,\text{for}\, s \neq j.$$

This reduces the dimensionality of the problem, as we only need to focus on one choice variable for the incumbent, namely θ_t, as a function of the state. The level of capital is the only relevant endogenous state variable because human capital is proportional to physical capital, so the former does not evolve independently from the latter.

The key equilibrium object that we need to find in the politico-equilibrium is the expropriation rate on FDI, denoted by $\Theta_j(K)$, chosen by group j when in power. This function is stationary (independent of time) because of the infinite horizon assumption. Since all groups are symmetric, it is reasonable to look for *symmetric* Markov-perfect equilibria,

$$\Theta_j(K) = \Theta(K), \ \forall j,$$

where the equilibrium rate is independent of the identity of the group in power.

It is useful to make a change in notation at this point: variables dated at period t have no time subscript and variables dated in future periods will be denoted by primes (that is, K denotes today's capital, K' denotes K_{t+1}, etc.).

Consider the problem faced by a representative group in power. It needs to choose the expropriation rate on FDI, θ, taking as given the behavior of the domestic sector and foreign firms, as well as competitive prices and aggregates. In particular, it needs to take into account the effects of the expropriation rate chosen on:

- transfers to the group it represents, via the government budget constraint

$$\mathcal{T}(K,\theta) = n\theta\mathcal{I}(K,\theta).$$

- the consumption of the members of its constituency when the group is in power, because it is maximizing their utility

$$\mathcal{C}(K,\theta) = f_L(K) + \mathcal{T}(K,\theta). \tag{6}$$

- capital accumulation, $K' = \mathcal{H}(K,\theta)$, implicitly defined by the firms' first order condition

$$D_I(I,K) + (1+\theta) = \frac{1}{1+r^*}\left(f'_K - D_K(I',K') + (1-\delta)[D_I(I',K') + (1+\Theta(K'))]\right)$$

  where $I = \mathcal{I}(K,\theta) = \mathcal{H}(K,\theta) - (1-\delta)K$ denotes current investment and $I' = \mathcal{I}(K',\Theta(K')) - (1-\delta)K'$ denotes future investment. Note that this is the recursive representation of eq. (5).

- the consumption of the members of its constituency when the group is *out* of power, because there is a probability that next period a different group is in power:

$$\tilde{\mathcal{C}}(K',\Theta(K')) = f_L(K'),$$

The group in power chooses θ so as to maximize the utility of a representative agent in its constituency (recall that, within a region, all agents are identical)

$$\max_\theta u(\mathcal{C}(K,\theta)) + \beta\{pV(K') + (1-p)W(K')\} \text{ s.t.} \tag{P1}$$
$$K' = \mathcal{H}(K,\theta), \text{ and}$$
$$\theta' = \Theta(K').$$

where $V(K)$ corresponds to the value function of an agent whose group is in power, and the equilibrium policy Θ is followed,

$$V(K) = u(\mathcal{C}(K,\Theta(K))) + \beta\Big\{pV\Big(\mathcal{H}(K,\Theta(K))\Big) + (1-p)W(\mathcal{H}\Big(K,\Theta(K))\Big)\Big\} \tag{7}$$

and $W(K)$ is the value function when it is out of power,

$$W(K) = u(\tilde{\mathcal{C}}(K,\Theta(K))) + \beta\Big\{qV\Big(\mathcal{H}(K,\Theta(K))\Big) + (1-q)W\Big(\mathcal{H}(K,\Theta(K))\Big)\Big\}. \tag{8}$$

Notice that the probability of regaining power when the group is not an incumbent is q, potentially different from p.

The policymaker chooses the current expropriation rate, taking as given future expropriation levels, and assuming that future governments follow the equilibrium rule $\Theta(K)$. In order for $\Theta(K)$ to be a Markov-perfect equilibrium, it must be the case that no group has an incentive to deviate from this equilibrium at any point in time. In other words, it must be optimal for *any* policymaker to follow this rule when in power.

Definition 2 *A Markov-perfect equilibrium is an expropriation-rate function Θ solving*

$$\Theta(K) = arg\max_{\theta} u(\mathcal{C}(K,\theta)) + \beta\{pV(K') + (1-p)W(K')\}.$$

A final remark is in order: in contrast to Aguiar and Amador [2011], this maximization problem cannot be written as that of a hyperbolic-discounting agent. The equivalence would hold only in the case in which the group's consumption when out of power was equal to zero.[13]

4.2 Finding and characterizing the MPE

Following Klein, Krusell, and Rios-Rull (2008), I will focus on differentiable MPE, where $\Theta(K)$ is a smooth function of the state K. Under this assumption it is possible to find a functional equation that determines the optimal expropriation rate as a function of the level of capital in the economy.

The first order condition of a representative group in power can be obtained by deriving (P1) with respect to θ,

$$\Upsilon_\theta + \beta\{pV'_K + (1-p)W'_K\}\mathcal{H}_\theta = 0 \tag{9}$$

where, to simplify the notation and derivations, Υ_x denotes the derivative of instantaneous utility with respect to x, $\Upsilon_x = u_c\mathcal{C}_x$, with $x \in \{K, \theta\}$. This equation implies that the marginal gain of expropriating FDI today (and increasing transfers) must equal the cost of reduced FDI inflows to the country in continuation utility (whether in or out of power next period). This condition can be re-written as an Euler equation for the government, as shown in Proposition 1.

Proposition 1 *The government's first order condition can be written as*

$$\Upsilon_\theta + \beta\left\{p\left(\Upsilon'_K\mathcal{H}_\theta + \Upsilon'_\theta\frac{\partial\theta'}{\partial\theta}\right) + (1-p)\tilde{\Upsilon}'_K\mathcal{H}_\theta + \right. \tag{10}$$

$$\left.\frac{dK''}{d\theta}\left[\beta(q-p)\left(\Upsilon''_K\mathcal{H}'_\theta + \Upsilon''_\theta\frac{\partial\theta''}{\partial\theta'}\right) - (1-q)\Upsilon'_\theta\right]\frac{1}{\mathcal{H}'_\theta}\right\} = 0.$$

with $\frac{dK''}{d\theta} = (\mathcal{H}'_K + \Theta'_K\mathcal{H}'_\theta)\,\mathcal{H}_\theta$ *and* $\frac{d\theta'}{d\theta} = -\frac{\mathcal{H}_\theta\mathcal{H}'_k}{\mathcal{H}'_\theta}$.

[13] See Amador [2003] for a proof of hyperbolic equivalence, as it can be applied straightforwardly to this environment.

Proof. See Appendix 6.2. ■

This equation is referred in the literature as a 'Generalized Euler Equation' because of its parallel to the Euler equation faced by an agent (i.e. an expression that is independent of the value function). It is a functional equation that, for any K, determines the equilibrium expropriation function $\Theta(K)$. It is worth noticing that, in contrast with a traditional Euler equation, this expression depends not only on the level of expropriation rate, but also on the derivative of this policy function, $\Theta_K(K)$.

The first term, $\Upsilon_\theta = u_c \mathcal{T}_\theta$, captures the fact that when the expropriation rate increases, there is a direct effect on agents' consumption since those favored by the group in control receive an increase in the transfer of $\mathcal{T}_\theta$.

When the expropriation rate is increased today, firms react by cutting FDI by $\mathcal{H}_\theta$ units. This reduces the amount of capital available for production next period, modifying tomorrow's consumption by causing the next policymaker to reduce the level of transfers. The group in power will retain control of the government with probability p, in which case the change in the continuation utility is affected due to the lower amount of capital in the economy, affecting consumption directly through $\Upsilon'_k = u_c \mathcal{C}'_K$ and indirectly through the change in tomorrow's transfers θ'. A change in the current expropriation rate, by reducing FDI can affect the way in which future policymakers will choose the expropriation rate, as captured by the term $\frac{d\theta'}{d\theta}$, which has an effect on Υ'_θ tomorrow. This can be seen as an instrument to *manipulate* tomorrow's policymaker.

The group will be out of power next period with probability $1-p$, in which case the continuation utility changes only through their effect on the stock of capital (since the group receives no transfers when out of power). This is seen in the second term of the first row.

Finally, the term in the second row is associated with the change in expected utility two periods from now that is triggered by the increase in θ today. This affects K'', and hence consumption and transfers at that point in time. The first term is only relevant when the probability of regaining power is independent of whether the group is in power (that is, when q is different from p). Under no incumbency advantage, the term would vanish. The second term captures the effects of political instability, as it would disappear were p equal to 1.

4.3 Balanced growth path

In order to further characterize the equilibrium, I will make specific functional assumptions about preferences and technology. These will ensure the existence of a balanced growth path where variables grow at a constant rate.

Assumption 2 *Suppose that*

- *The utility of domestic workers is CRRA,*

$$u(c) = \frac{c^{1-\sigma} - 1}{1-\sigma}$$

  where σ represents the degree of risk aversion, with the standard convention that the instantaneous utility is logarithmic, $u(c) = \log(c)$, when $\sigma \to 1$.

- *The production function is Cobb-Douglas*

$$F(k, HL) = Ak^\alpha (HL)^{1-\alpha}.$$

- *Adjustment costs satisfy*

$$D(I,k) = \frac{\gamma}{2}\left(\frac{I}{k}\right)^2 k.$$

Under this parametrization, $w = (1-\alpha)Ak^{\alpha}H^{1-\alpha}(L)^{-\alpha}$. Since $H = K = k$ and $L = 1$, we find that wages depend linearly on K:

$$w = (1-\alpha)AK.$$

The productivity of capital, on the other hand, is constant: $f_K = \alpha A$. The law of motion for FDI eq. (5) in the political equilibrium becomes

$$\gamma\frac{I}{K} + 1 + \Theta(K) = \frac{1}{1+r^*}\left[\alpha A + (1-\delta)(1+\Theta(K')) + \frac{\gamma}{2}\left(\frac{I'}{K'}\right)^2 + (1-\delta)\gamma\frac{I'}{K'}\right], \quad (11)$$

where $I = K' - (1-\delta)K$. This functional equation determines the growth rate of capital $\kappa = \frac{K'}{K}$, which may be non-stationary due to the fact that expropriation could depend on the stock of capital, $\Theta(K')$. The following proposition shows that a Markov-perfect equilibrium is consistent with a *balanced growth path.* That is, there exists a time-invariant tax rate that satisfies the government's Euler equation and under which capital grows at a constant rate, $\kappa = \kappa'$. Since all other allocations are linear in capital, they grow at constant rates as well.

Proposition 2 *Under Assumption 2, there exists a balanced-growth Markov-perfect politico equilibrium (BG-MPE) in which the expropriation rate is constant $\Theta(K) = \bar{\theta}$ and allocations in the domestic economy grow at a time-invariant rate. In particular,*

1. *Capital grows at rate $\bar{\kappa} = \kappa(\bar{\theta})$, with*

$$\kappa(\bar{\theta}) = 1 + r^* - \sqrt{(r^*+\delta)^2 - \frac{2}{\gamma}[\alpha A - (1+\bar{\theta})(r^*+\delta)]} \quad (12)$$

2. *Investment is proportional to capital*

$$\frac{I}{K} = \bar{\kappa} - (1-\delta) \equiv \tilde{\kappa}$$

3. *Transfers and consumption are linear in K*

$$\frac{\mathcal{T}(K,\bar{\theta})}{K} = n\bar{\theta}\tilde{\kappa}$$

$$\mathcal{C}(K,\theta) = \left[(1-\alpha)A + n\bar{\theta}\frac{I}{K}\right]K,$$

$$\tilde{\mathcal{C}}(K,\theta) = (1-\alpha)AK,$$

implying that aggregate consumption grows at a constant rate.

4. *The expropriation rate $\bar{\theta}$ solves*

$$\upsilon_{\bar{\theta}}\left[1 - \beta p\bar{\kappa}^{1-\sigma} - \beta^2\bar{\kappa}^{2(1-\sigma)}(q-p) - \beta\bar{\kappa}^{1-\sigma}(1-q)\right] \quad (13)$$

$$+\beta\bar{\kappa}^{-\sigma}\kappa_{\bar{\theta}}e(\bar{\theta})^{1-\sigma}\left\{p + (1-p)\left(\frac{\tilde{e}}{e(\bar{\theta})}\right)^{1-\sigma} + \beta\bar{\kappa}^{1-\sigma}(q-p)\right\} = 0,$$

where $e(\bar{\theta}) = (1-\alpha)A + n\bar{\theta}\tilde{\kappa}$, $\tilde{e} = (1-\alpha)A$, and $\upsilon_{\bar{\theta}} = n(\tilde{\kappa} + \bar{\theta}\kappa_{\bar{\theta}})$.

Proof. See Appendix 6.3. ■

Replacing eq. (12) into eq. (13) we obtain an expression that implicitly determines the expropriation rate $\bar{\theta}$ as a function of political instability p, the degree of risk aversion σ, the productivity level A and the degree of fractionalization n. A few remarks are in order. First, there may be non-balanced growth path equilibria in this economy that are Markov-perfect. I am limiting the analysis to a stationary situation where the growth rate is constant. This is in line with the analysis performed in the endogenous growth and macroeconomic literatures, and is analogous to the study of a steady state in a non-growing economy. Second, the economy may grow or shrink for arbitrary parameterizations. Because the expropriation rate is only implicitly defined, it is not possible to determine a set of restrictions on the parameter space ensuring $\bar{\kappa} \geq 1$, but this will be imposed in the numerical simulations below. Third, due to the non-linearity of the expressions, there may be more than one BG-MPE that satisfies eq. (13).

4.3.1 Incumbency advantage, fractionalization, and FDI

Using the findings from Proposition 2, we can show that there exists a negative relationship between expropriation and growth.

Corollary 2.1 *Countries with high expropriation rates grow at lower rates*

$$\kappa_{\bar{\theta}} = -\frac{r^* + \delta}{\gamma(1 + r^* - \bar{\kappa})} < 0. \tag{14}$$

Proof. Differentiating eq. (12) in Proposition 2. ■

Intuitively, higher expropriation rates deter foreign direct investment, and this in turn hinders growth.

Corollary 2.2 *When utility is logarithmic (e.g., $\sigma \to 1$) and there is full depreciation $\delta = 1$, there exists a unique expropriation rate θ that is:*

1. *Strictly positive, $\bar{\theta} > 0$.*
2. *Independent of incumbency advantage,*

$$\frac{\partial \bar{\theta}}{\partial \xi} = 0,$$

3. *Increasing in fractionalization*

$$\frac{\partial \bar{\theta}}{\partial n} > 0.$$

Proof. See Appendix 6.4 ■

The corollary shows that, under logarithmic utility, the effects of political instability on the expropriation rate depend critically on the source of political instability. In this model, $p = \frac{1}{n} + \xi$, so there are two possible causes for higher political turnover (e.g. low p). The first one is low incumbency advantage ξ, as this makes it less likely that the group in power controls the government next period. The second one is a high degree of fractionalization

n, as a larger number of groups in society reduces the chances that any given one of them gains control of the government. When utility is logarithmic, we find that the first source of political instability does not affect expropriation rates whereas the second one does. The intuition behind the second result can be understood by noting that the costs of increasing $\bar{\theta}$ are borne by all individuals in society (as the overall growth rate κ goes down), but its benefits are enjoyed only by the group in power. As the number of social groups n increases, those benefits get shared by a smaller number of individuals within the group, so the transfer per agent in the group becomes bigger. The incentives to expropriate in order to consume the transfers immediately are therefore larger, implying that $\bar{\theta}$ increases with n. It is the nature of the common pool problem rather than the effects of changing the degree of impatience (by reducing the likelihood of remaining in power) that drives this result. Hence, if preferences were logarithmic, we should expect a negative correlation between fractionalization and investment risk on FDI, but not between incumbency advantage and investment risk.

This example shows that the effective discount factor of the government is not necessarily affected by the degree of political turnover, emphasizing the differences between an incumbent group and a planner with time-inconsistent preferences. Aguiar and Amador (2011), by assuming that the benefits of being in power are proportional to those of being out of power, showed an equivalence result between the policymaker and an agent with quasi-hyperbolic preferences (see Laibson [2007]). More specifically, they assume that the instantaneous utility when in power is $\mu u(c)$ whereas it is $u(c)$ when out of power, with $\mu > 1$. This implies that the marginal value of a unit of capital, namely $\Upsilon_k = \mu u_c \mathcal{C}_k$, when in power relative to that out of power $\tilde{\Upsilon}_k = u_c \mathcal{C}_k$ is exogenous and equal to μ. Under this assumption, they show that higher political turnover $1 - p$ translates to a more impatient government. The equivalence breaks in this paper because the ratio of marginal utilities (in and out of power) is neither exogenous nor constant. Moreover, the relative marginal value of an extra unit of capital when in power to that when out of power $\Upsilon_k / \tilde{\Upsilon}_k$ is *endogenous*, as it can be affected by the expropriation rate. Hence, while it is true that higher p increases the benefits of leaving FDI undistorted (by making expected utility higher) and hence increases the effective discount factor, it also changes the relative value of a dollar when in power and out of power. This additional effect may create incentives to actually reduce expropriation rates. The strength of the second effect is closely linked to the inter-temporal elasticity of substitution σ. As Corollary 2.2 shows, when $\sigma = 1$, the 'effective discount factor effect' is exactly offset by the relative 'value of a dollar effect.' As a result, expropriation rates are unaffected by increases in incumbency advantage (and hence p).

The result in the corollary is not general, however, as incumbency advantage affects the expropriation rate (and hence growth) when $\sigma \neq 1$.

Corollary 2.3 *The expropriation rate on FDI is affected by incumbency advantage,* $\frac{\partial \bar{\theta}}{\partial \xi} \neq 0$*, when* $\sigma \neq 1$*.*

Proof. By a numerical counterexample. ■

I have not been able to characterize $\frac{\partial \bar{\theta}}{\partial \xi}$ theoretically, but a numerical simulation shows that incumbency advantage affects expropriation for more generic CRRA functions, indicating that the independence of $\bar{\theta}$ from ξ under logarithmic utility is a knife-edge case. Figure 2 depicts the growth rate of the domestic economy (left panel) together with the expropriation rate (right panel) as a function of political stability p, where n is kept constant and ξ increases such that government stability p belongs to $[1/n, 1]$ (the series are depicted as functions of p rather than ξ to ease interpretation). The parameters used are $\sigma = 0.9$, $\beta = 0.91$, $\alpha = 0.4$, $\gamma = 25$, $\delta = 0.06$, $n = 10$, $A = 1.53$, and $\beta(1 + r^*) = 1.03$ so the growth rate in the rest of the world is 3%.

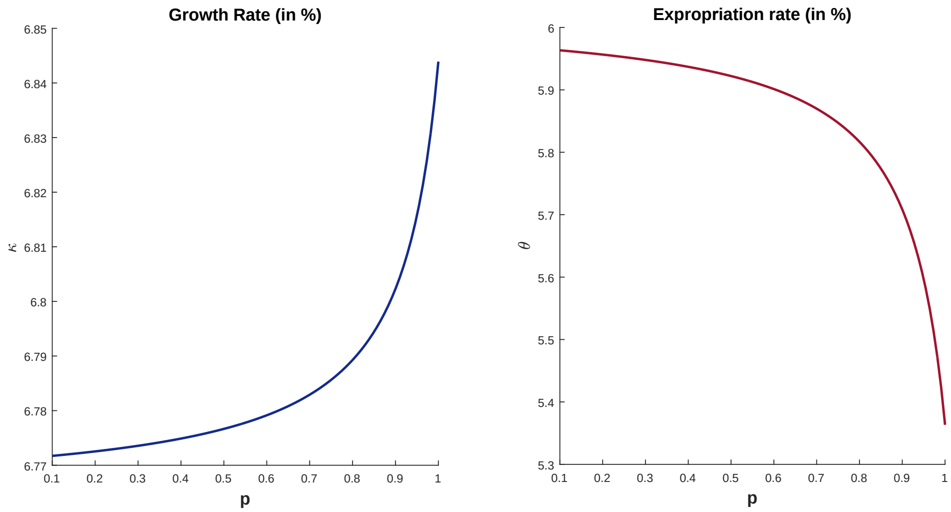

Figure 2: Growth Rate κ and Expropriation Rate $\bar{\theta}$ as a function of incumbency advantage.

Parameters: $\sigma = 0.9$, $\beta = 0.91$, $\alpha = 0.4$, $\delta = 0.06$, $n = 10$, $\beta(1 + r^*) = 1.03$, $A = 1.53$.

We can see that $\bar{\theta}$ is negatively related to incumbency advantage in this case. The intuition behind this result comes from the redistributive uncertainty and is similar to that in Amador and Aguiar (2011) or Azzimonti (2011). When a group representing one of the social groups is in power, it chooses expropriation rates on FDI so as to trade-off the gains obtained from redistribution (from foreign firms to its own group) against the losses incurred by the resulting reductions in FDI (which limit future redistribution). Because the policymaker knows that with high probability, $1 - p$, one of the other groups will be choosing expropriation rates in the future, it has incentives to *over-expropriate* in the current period and consume the resources today with certainty. Recall that, if out of power in the future, no transfers will be received. The political uncertainty induces myopic behavior from policymakers, as the benefits from an extra unit of foreign direct investment resulting from low expropriation are not fully internalized (i.e. the extra level of transfers that could be afforded). The effect is stronger as the probability of remaining in power decreases.

Remark 1 *Under $\sigma < 1$, we should observe that economies with high political turnover (frequent changes of power due to low incumbency advantage) exhibit a bias towards spending in transfers, relatively high expropriation rates, relatively low levels of FDI, and low growth rates.*

We can also study the effects of fractionalization by increasing the number of groups n while keeping constant the degree of incumbency advantage ξ. Figure 3 depicts the growth rate and expropriation rates for the benchmark economy as a function of $n \in [10, 15]$ for three alternative values of $\xi \in \{0, 0.5, 0.9\}$ (depicted as the solid red line, the broken blue line, and the dotted black line, respectively). Changing the degree of fractionalization affects two things: (i) government instability and (ii) the importance of the common pool problem. Increasing n is analogous to decreasing incumbency advantage in terms of its qualitative effect on p. A larger number of social groups reduces the probability for the incumbent to retain power, and hence her incentives to promote growth through low expropriation rates. In addition, and consistent with what we found for the logarithmic example, a higher number of groups results in a greater incentive to expropriate FDI as the size of transfers per capita becomes larger. Taken together, both effects result in higher $\bar{\theta}$ and lower κ as n rises. Quantitatively, the effect of fractionalization is stronger than that of incumbency advantage under this parameterization.

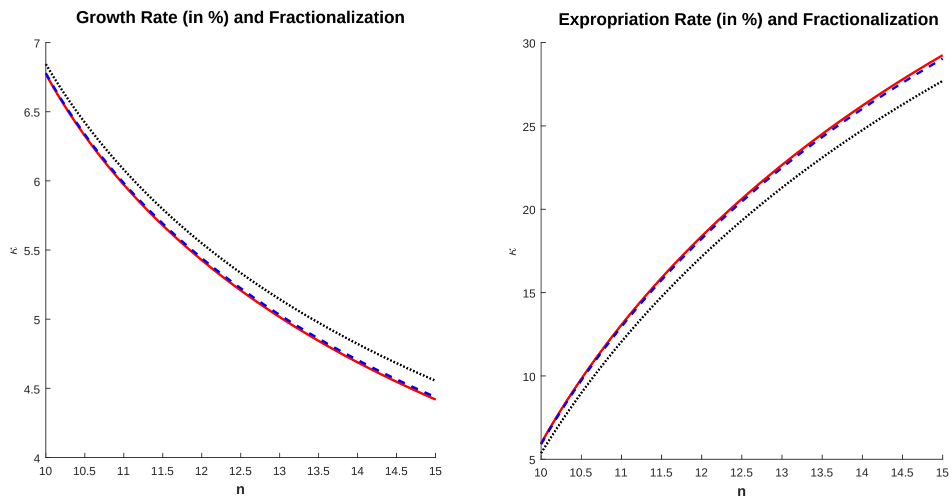

Figure 3: Growth Rate κ and Expropriation Rate $\bar{\theta}$ as a function of fractionalization n .

Parameters: Benchmark parameters are $\sigma = 0.9$, $\beta = 0.91$, $\alpha = 0.4$, $\delta = 0.06$, $\beta(1+r^*) = 1.03$, and $A = 1.53$. The solid red line considers $\xi = 0$, the broken blue line $\xi = 0.5$, and the dotted black line $\xi = 0.9$.

4.3.2 Efficiency of the MPE

In this section I want to emphasize the detrimental effects of redistributive uncertainty and fractionalization in expropriation policies and ultimately growth. To that end, I analyze the properties of expropriation policy chosen by a benevolent planner that places equal weight to all social groups in the economy (e.g., that maximize the welfare of all citizens). I assume that the planner is subject to the same constraints as policymakers representing different social groups. That is, it has access to the same policy instruments (expropriations and group-specific transfers) and does not have a commitment technology. Thus, the only difference between the planner and a politician is that, by giving some weight to all individuals in society, the former is not subject to the common pool problem. This, in turn, implies that it does not suffer from redistributive uncertainty due to political turnover: a planner with identical preferences will replace the current planner with probability one next period.

The planner solves

$$J(K) = \max_{\theta} u(\mathcal{C}^*(K,\theta)) + \beta J(K'), \tag{15}$$

where $K' = \mathcal{H}(K,\theta)$ is the same as in the benchmark case, $\mathcal{C}^*(K,\theta)$ is given by eq. (6), but where transfers per capita are now:

$$\mathcal{T}^*(K,\theta) = \theta I(\theta).$$

The difference between $\mathcal{T}(K,\theta)$ and $\mathcal{T}^*(K,\theta)$ is that in the political equilibrium, groups only collect transfers for their constituency, while under a planner all agents receive them (so transfers per individual are θI rather than $n\theta I$ as before). A second difference between the efficient problem and the one solved in the political equilibrium is that the planner does not face uncertainty whereas a given group stays in power with probability $p < 1$.

It is possible to show that the efficient solution also admits a balanced growth path.

Proposition 3 *Under Assumption 2, there exists an efficient balanced-growth path (EBG) in which the expropriation rate is constant, $\Theta(K) = \bar{\theta}^*$ and allocations in the domestic economy grow at a time-invariant rate. In particular,*

1. *Consumption and capital grow at rate $\kappa^* = \kappa(\bar{\theta}^*)$, with $\kappa(.)$ defined as in Prop 3.*
2. *Investment is proportional to capital, with $\frac{I}{K} = \tilde{\kappa}^* = \kappa^* - (1-\delta)$.*
3. *Transfers are linear in K, $\mathcal{T}(K,\bar{\theta}^*) = \bar{\theta}^*\tilde{\kappa}^* K$*
4. *The expropriation rate $\bar{\theta}$ solves*

$$\left[\tilde{\kappa}^* + \bar{\theta}^*\kappa^*_{\bar{\theta}}\right]\left(1 - \beta\,(\kappa^*)^{1-\sigma}\right) + \beta\,(\kappa^*)^{-\sigma}\,\kappa^*_{\bar{\theta}}\bar{\theta}^*\tilde{\kappa}^* = -\beta\,(\kappa^*)^{-\sigma}\,\kappa_{\bar{\theta}^*}(1-\alpha)A. \tag{16}$$

Proof. See Appendix 6.5. ■

We can easily see that $\bar{\kappa} \neq \kappa^*$, so the expropriation rate in the political equilibrium is generally inefficient. Moreover, this holds even when the incumbent faces no political uncertainty.

Corollary 3.1 *For any $n > 1$, the BG-MPE is inefficient even under no political instability (i.e. $p = 1$). Moreover, if utility is logarithmic and $\delta = 1$, we have that*

$$\bar{\theta} > \bar{\theta}^* \quad \textit{and} \quad \bar{\kappa} < \bar{\kappa}^*.$$

Proof. See Appendix 6.6. ■

Hence, political frictions create inefficiently large expropriation rates and low growth even if the incumbent knows for sure that it will remain in power forever after. This result is in sharp contrast with previous studies in which the only source of inefficiency is given by an excessive degree of impatience caused by political uncertainty, such as Amador and Aguiar (2011) or Azzimonti (2011). The main difference lies on the fact that in those papers the disagreement was about the composition of a public good, whereas here it lies on the size of targeted transfers. In the current environment, the common pool problem has both a dynamic and a static component. As a result, even a 'benevolent dictator' will distort the growth rate by excessively expropriating FDI. This illustrates how fractionalization may be detrimental to growth even in autocratic regimes.

Under redistributive uncertainty $p < 1$, there is a second source of inefficiency that arises from myopia. From the numerical example, it is possible to see that the problem is aggravated by the higher political instability (figures omitted, but available upon request). The smaller the value of p (i.e. greater government instability), the further away FDI inflows are from their efficient level. In terms of welfare, the uncertainty over the identity of tomorrow's policymaker introduces volatility in private consumption, which is absent in the planner's solution (keep in mind that there are no shocks in this economy other than the identity of the group in power). Welfare along the BG-MPE is lower not only because the amount of resources is smaller, but also because individuals suffer from artificial fluctuations in consumption caused by the volatility in targeted transfers.

5 Conclusions

In this paper, I examine the role of political instability as a potential explanation for the lack of capital flows from rich countries to poor countries. I first do this empirically by studying the relationship between FDI, investment risk, and politically instability in a large set of countries between 1984 and 2014. I then provide a dynamic political economy model of redistributive conflict to explore the theoretical mechanism.

There are several simplifying assumptions that were made in order to reduce the dimensionality of the problem. First, workers are excluded from capital markets. If domestic agents were allowed to save, expropriation would be costlier because FDI acts as an externality in production. By discouraging FDI, the returns to savings—and hence future income—would be reduced. Secondly, all groups are assumed to be identical and, in particular, have the same number of supporters. If there is a clear majority with a larger probability of being in power, the BG-MPE would no longer be symmetric. As in Azzimonti and Talbert (2014), we would expect cycles to arise as groups that gain power less often become more myopic and choose to expropriate larger amounts. This also introduces some uncertainty over policy that would affect the way in which FDI is chosen by firms and potentially generate FDI cycles. Finally, it would be interesting to develop a model where alternation of power is endogenous.

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6 Appendix

6.1 List of countries

The list of countries in each region is presented in Table 6.

OECD	*East Asia*	*Latin America*	*Africa*	*Other*	*Other, cont'd*
Australia	Bahrain	Argentina	Algeria	Albania	Saudi Arabia
Austria	Bangladesh	Bolivia	Angola	Armenia	Serbia
Belgium	China	Brazil	Botswana	Azerbaijan	Serbia & Montenegro
Canada	Hong Kong	Chile	Burkina Faso	Bahamas	Slovakia
Denmark	India	Colombia	Cameroon	Bahrain	Slovenia
East Germany	Indonesia	Costa Rica	Congo	Bangladesh	Sri Lanka
Finland	Japan	Cuba	Congo, DR	Belarus	Suriname
France	Malaysia	Ecuador	Cote d'Ivoire	Brunei	Syria
Germany	Mongolia	El Salvador	Egypt	Bulgaria	Trinidad & Tobago
Greece	Pakistan	Guatemala	Ethiopia	Croatia	UAE
Iceland	Philippines	Guyana	Gabon	Cyprus	Ukraine
Ireland	Singapore	Haiti	Gambia	Czech Republic	USSR
Italy	South Korea	Honduras	Ghana	Dominican Republic	Yemen
Luxembourg	Sri Lanka	Mexico	Guinea	Estonia	
Netherlands	Thailand	Nicaragua	Guinea-Bissau	Hungary	
New Zealand	Vietnam	Panama	Kenya	India	
Norway		Paraguay	Libya	Iran	
Portugal		Peru	Madagascar	Iraq	
Spain		Uruguay	Malawi	Israel	
Sweden		Venezuela	Mali	Jamaica	
Switzerland			Morocco	Jordan	
Turkey			Mozambique	Kazakhstan	
United Kingdom			Namibia	Kuwait	
United States			Niger	Latvia	
West Germany			Nigeria	Lebanon	
			Senegal	Lithuania	
			Sierra Leone	Malta	
			Somalia	Moldova	
			South Africa	New Caledonia	
			Sudan	Oman	
			Tanzania	Pakistan	
			Togo	Papua New Guinea	
			Tunisia	Poland	
			Uganda	Qatar	
			Zambia	Romania	
			Zimbabwe	Russia	

Notes: Sample period is 1984-2014 for all countries with the following exceptions in starting

- 1985-1986: Angola, Mongolia, Namibia, Uganda
- 1988: Hong Kong, Tanzania
- 1990: Bulgaria, Libya, Moldova, Poland, Romania, Yemen
- 1991: Haiti, Hungary
- 1992: Albania, Armenia, Belarus, Ethiapia, Kazakhstan, Ukraine
- 1993: Czech Republic, Slovakia
- 1995: Azerbaijan, Croatia, Estonia, Latvia, Lithuania, Slovenia
- 2001: Brunei, Lebanon
- 2002: Luxembourg, Belgium
- 2006: Serbia

In addition, New Caledonia's sample comprises the period 1984-2000.

Table 6: Countries Included by Region

6.2 Proof of Proposition (10)

We can obtain an expression for V_K by differentiating eq. (7) with respect to capital,

$$V_K(K) = \Upsilon_K + \beta\{pV'_K + (1-p)W'_K\}\mathcal{H}_K + \underbrace{[\Upsilon_\theta + \beta\{pV'_K + (1-p)W'_K\}\mathcal{H}_\theta]}_{=0 \text{ by eq. } 9}\Theta_K,$$

$$\Rightarrow V_K(K) = \Upsilon_K + \beta\{pV'_K + (1-p)W'_K\}\mathcal{H}_K.$$

Notice that from (9) we get

$$\beta\{pV'_K + (1-p)W'_K\} = -\frac{\Upsilon_\theta}{\mathcal{H}_\theta}. \tag{17}$$

Therefore,

$$V_K(K) = \Upsilon_K - \Upsilon_\theta \frac{\mathcal{H}_K}{\mathcal{H}_\theta} \tag{18}$$

Notice the difference between this condition and the one that we would normally see in a neoclassical growth model. In the traditional model, the marginal value of a unit of investment is given by the increase in marginal utility driven by the extra consumption that this unit of capital produces (i.e. $V_K(K) = \Upsilon_K$). In this economy, the equality is broken for two reasons: first, because foreigners decide how much to invest, and not the domestic workers; second, because the envelope theorem does not hold in economies where the identity of the policymaker may change over time.

We can obtain W_K by differentiating (8) with respect to capital,

$$W_K(K) = \tilde{\Upsilon}_K + \beta\{qV'_K + (1-q)W'_K\}\mathcal{H}_K + [\tilde{\Upsilon}_\theta + \beta\{qV'_K + (1-q)W'_K\}\mathcal{H}_\theta]\Theta_K, \tag{19}$$

where $\tilde{\Upsilon}_K$ denotes the marginal change in instantaneous utility triggered by an increase in FDI when the agent's group is out of power. Since agents do not receive transfers in a such case, the marginal utilities of consumption and labor are such that $\tilde{\Upsilon}_K \neq \Upsilon_K$. This implies that the second term in the expression is different from zero, in contrast to the case of $V(K)$. Because there are no transfers when out of power, $\tilde{\Upsilon}_\theta = 0$.

From eq. (9), we have that

$$W'_k = -\left[\frac{\Upsilon_\theta}{\mathcal{H}_\theta\beta} + pV'_k\right]\frac{1}{1-p},$$

Replacing this into 19,

$$W_K(K) = \tilde{\Upsilon}_K + \beta\frac{1}{1-p}\left[(q-p)V'_k - (1-q)\frac{\Upsilon_\theta}{\mathcal{H}_\theta\beta}\right]\Big(\mathcal{H}_K + \mathcal{H}_\theta\Theta_K\Big). \tag{20}$$

Replacing eq. (18) into eq. (20) we can obtain an expression W'_K independent of value functions. Updating such expression, together with eqs. (18) and (19) (that is, evaluating them in tomorrow's capital) and replacing them back in the first order condition eq. (9) we obtain the following equation

$$\Upsilon_\theta + \beta\mathcal{H}_\theta\left\{p\left(\Upsilon'_K - \frac{\Upsilon'_\theta}{\mathcal{H}'_\theta}\mathcal{H}'_k\right) + (1-p)\tilde{\Upsilon}'_K\right\} + \tag{21}$$

$$\beta^2\left\{(q-p)\left(\Upsilon''_K - \frac{\Upsilon''_\theta}{\mathcal{H}''_\theta}\mathcal{H}''_k\right) - (1-q)\frac{\Upsilon'_\theta}{\mathcal{H}'_\theta\beta}\right\}\left(\mathcal{H}'_K + \Theta'_K\mathcal{H}'_\theta\right)\mathcal{H}_\theta = 0.$$

To obtain eq. (10), note that the total change in K'' when θ increases is

$$\frac{dK''}{d\theta} = \left(\mathcal{H}'_K + \Theta'_K \mathcal{H}'_\theta\right) \mathcal{H}_\theta,$$

and that the change in θ' when θ rises such that $dK'' = 0$ is

$$\frac{d\theta'}{d\theta} = -\frac{\mathcal{H}_\theta \mathcal{H}'_k}{\mathcal{H}'_\theta},$$

and re-arrange ■

6.3 Proof of Proposition (2)

Parts 1, 2, and 3 Imposing the balanced growth path (BGP) condition $\bar{\kappa} = \frac{K'}{K}$, we obtain

$$\frac{I}{K} = \frac{K'}{K} - (1-\delta) = \bar{\kappa} - (1-\delta) = \tilde{\kappa}$$

Replacing this into eq. (11), we have

$$\gamma\tilde{\kappa} + 1 + \Theta(K) = \frac{1}{1+r^*}\left[\alpha A + (1-\delta)(1+\Theta(K')) + \frac{\gamma}{2}\tilde{\kappa}^2 + (1-\delta)\gamma\tilde{\kappa}\right]. \tag{22}$$

Clearly, a BGP requires a constant expropriation rate. Imposing $\Theta(K) = \bar{\theta}$, we obtain the following quadratic expression

$$\tilde{\kappa}^2 - 2(r^*+\delta)\tilde{\kappa} + \frac{2}{\gamma}\Big(\alpha A - (1+\bar{\theta})(r^*+\delta)\Big) = 0,$$

which admits the following two roots

$$\tilde{\kappa} = (r^*+\delta) \pm \sqrt{(r^*+\delta)^2 - \frac{2}{\gamma}\Big(\alpha A - (1+\bar{\theta})(r^*+\delta)\Big)}.$$

The growth rate of capital is $\bar{\kappa} = \tilde{\kappa} + 1 - \delta$, or

$$\bar{\kappa} = (1+r^*) \pm \sqrt{(r^*+\delta)^2 - \frac{2}{\gamma}\Big(\alpha A - (1+\bar{\theta})(r^*+\delta)\Big)}. \tag{23}$$

Lemma 1 *There is only one root consistent with $v_0 < \infty$ (e.g. a finite value of the firm),*

$$\bar{\kappa} = 1 + r^* - \sqrt{(r^*+\delta)^2 - \frac{2}{\gamma}\Big(\alpha A - (1+\bar{\theta})(r^*+\delta)\Big)}.$$

Proof. The value for the firm is

$$\begin{aligned} v_0 &= \sum_{t=0}^{\infty} \frac{1}{(1+r^*)^t} d_t \\ &= \sum_{t=0}^{\infty} \frac{1}{(1+r^*)^t} \left\{\alpha A K_t - I_t(1+\theta_t) - \frac{\gamma}{2}\frac{I_t^2}{K_t}\right\} \end{aligned}$$

In the BGP,

$$v_0 = \left(\alpha A - (1+\bar{\theta})\tilde{\kappa} - \frac{\gamma}{2}\tilde{\kappa}^2\right) K_0 \sum_{t=0}^{\infty} \left(\frac{\bar{\kappa}}{1+r^*}\right)^t$$

with K_0 denoting initial capital. Hence,

$$\begin{aligned} v_0 < \infty \quad &\Leftrightarrow \quad \frac{\bar{\kappa}}{1+r^*} < 1 \\ &\Leftrightarrow \quad \bar{\kappa} < 1 + r^*. \end{aligned}$$

Inspecting eq. (23), we see that only one of the roots satisfies this condition. ■

To complete the proof of parts 1., 2., and 3. note that transfers satisfy

$$\frac{\mathcal{T}(K,\theta)}{K} = n\bar{\theta}\frac{I}{K} = n\bar{\theta}\tilde{\kappa}$$

Consumption when in power is,

$$\begin{aligned} \mathcal{C}(K,\theta) &= \left[(1-\alpha)A + n\bar{\theta}\frac{I}{K}\right] K \\ &= [(1-\alpha)A + n\bar{\theta}\tilde{\kappa}]K \equiv eK \end{aligned}$$

and when out of power is

$$\tilde{\mathcal{C}}(K,\theta) = (1-\alpha)AK \equiv \tilde{e}K,$$

so aggregate consumption is

$$\frac{1}{n}\mathcal{C}(K,\theta) + \frac{n-1}{n}\tilde{\mathcal{C}}(K,\theta) = \left[\frac{1}{n}e + \frac{n-1}{n}\tilde{e}\right] K,$$

which grows at rate $\bar{\kappa}$.

Part 4 Use the expressions derived in Parts 1, 2, and 3 to obtain the following:

$$\begin{aligned} \Upsilon_\theta &= \mathcal{C}^{-\sigma}\mathcal{C}_\theta \\ &= n[\tilde{\kappa} + \bar{\theta}\tilde{\kappa}_{\bar{\theta}}]e^{-\sigma}K^{1-\sigma} \\ &\equiv v_\theta e^{-\sigma}K^{1-\sigma}, \end{aligned}$$

$$\begin{aligned} \Upsilon_K &= \mathcal{C}^{-\sigma}\mathcal{C}_K \\ &= e^{1-\sigma}K^{-\sigma}, \end{aligned}$$

$$\begin{aligned} \tilde{\Upsilon}_K &= \Big[(1-\alpha)A\Big]^{1-\sigma} K^{-\sigma} \\ &= \tilde{e}^{1-\sigma}K^{-\sigma}. \end{aligned}$$

Note that using $K' = \bar{\kappa}K$, we can compute $\Upsilon'_\theta = \Upsilon_\theta\bar{\kappa}^{1-\sigma}$, $\Upsilon'_K = \Upsilon_K\bar{\kappa}^{-\sigma}$, and $\tilde{\Upsilon}'_K = \tilde{\Upsilon}_K\bar{\kappa}^{-\sigma}$. These imply $\Upsilon''_\theta = \Upsilon_\theta\bar{\kappa}^{2(1-\sigma)}$ and $\Upsilon''_K = \Upsilon_K\bar{\kappa}^{-2\sigma}$.

From the FDI's decision of firms $\mathcal{H}(K,\theta) = \bar{\kappa}K$, we have

$$\begin{aligned}\mathcal{H}_\theta &= \kappa_{\bar{\theta}} K \\ \mathcal{H}_K &= \bar{\kappa},\end{aligned}$$

which implies $\mathcal{H}'_\theta = \kappa_{\bar{\theta}}\bar{\kappa}K$ and $\mathcal{H}'_K = \bar{\kappa}$.

Using these, we can show

$$\frac{dK''}{d\theta} = (\bar{\kappa} + \Theta'_K \kappa_{\bar{\theta}} K')\, \kappa_{\bar{\theta}} K,$$

as $\Theta'_K = 0$ in the BGPME. We also have that

$$\frac{d\theta'}{d\theta} = -\frac{\mathcal{H}_\theta \mathcal{H}'_k}{\mathcal{H}'_\theta} = -1,$$

so $\frac{d\theta''}{d\theta'} = -1$. To obtain eq. (13), replace these into the GEE eq (10) and re-arrange ■

6.4 Proof of Corollary (2.2)

Part 1.: existence, uniqueness, and sign Under full depreciation $\kappa = \tilde{\kappa} = \bar{\kappa}$, and under logarithmic utility,

$$\Upsilon(K,\theta) = \ln\Big((1-\alpha)AK + \mathcal{T}(K,\theta)\Big),$$

implying that

$$\Upsilon_\theta = \frac{\upsilon_\theta}{e}, \quad \tilde{\Upsilon}_\theta = 0, \quad \text{and} \quad \Upsilon_K = \tilde{\Upsilon}_K = \frac{1}{K},$$

whereas $\mathcal{H}_\theta = \kappa_{\bar{\theta}} K$ and $\mathcal{H}_K = \bar{\kappa}$ as before. Replacing these into the GEE, eq (10), imposing balanced growth conditions, and re-arranging,

$$\Upsilon_\theta + \frac{\beta}{1-\beta}\frac{\kappa_{\bar{\theta}}}{\bar{\kappa}} = 0.$$

This expression can be re-written as

$$\underbrace{(1-\beta)[\bar{\kappa} + \bar{\theta}\kappa_{\bar{\theta}}] + \beta\bar{\theta}\kappa_{\bar{\theta}}}_{LHS} = \underbrace{-\beta\frac{\kappa_{\bar{\theta}}}{\bar{\kappa}}\frac{(1-\alpha)A}{n}}_{RHS}. \tag{24}$$

The right-hand side (RHS) is increasing in $\bar{\theta}$,

$$\frac{\partial RHS(\bar{\theta})}{\partial\bar{\theta}} = \beta\frac{(1-\alpha)A}{n}\left(\frac{\kappa_{\bar{\theta}}}{\bar{\kappa}}\right)^2 \frac{1+r^*}{1+r^*-\bar{\kappa}} > 0,$$

and equal to zero at the origin $RHS(0) = 0$.

The left-hand side (LHS) is decreasing in $\bar{\theta}$,

$$\frac{\partial LHS}{\partial\bar{\theta}} = (2-\beta)\kappa_{\bar{\theta}} + \bar{\theta}\kappa_{\bar{\theta}\bar{\theta}} < 0,$$

since $\kappa_{\bar{\theta}} < 0$ as shown in Corollary 2.1 and

$$\kappa_{\bar{\theta}\bar{\theta}} = \frac{\partial \kappa_{\bar{\theta}}}{\bar{\theta}} = -\frac{(\kappa_{\bar{\theta}})^2}{1 + r^* - \bar{\kappa}} < 0,$$

and positive at the origin, $LHS(0) > 0$. Hence, there exists a $\bar{\theta} > 0$ at which they intersect, $RHS = LHS$.

Part 2. Since the LHS and RHS of eq. (24) are independent of p, $\frac{\partial \bar{\theta}}{\partial \xi} = 0$.

Part 3. The LHS is independent of n. The RHS is increasing in n. Hence, for a small ϵ and $n'' = n' + \epsilon$, $RHS(n'') > RHS(n')$. This implies $\bar{\theta}(n'') > \bar{\theta}(n')$. We can approximate $\frac{\partial \bar{\theta}(n)}{\partial n}$ as follows

$$\frac{\partial \bar{\theta}(n)}{\partial n} \backsimeq \lim_{\epsilon \to 0} \frac{\bar{\theta}(n'') - \bar{\theta}(n')}{\epsilon} > 0 \ \blacksquare$$

6.5 Proof of Proposition (3)

The proof of Parts 1, 2, and 3 is analogous to those in (the proof of) Proposition 6.3. The only significant difference is that transfers satisfy $\mathcal{T}^*(K, \theta) = \theta I(\theta)$, whereas they were $\mathcal{T}(K, \theta) = n\theta I(\theta)$ in the political equilibrium. In addition, the expropriation rate $\bar{\theta}^*$ is potentially different from $\bar{\theta}$.

The proof of Part 4. is more involved, as we need to re-compute the GEE. Recall that the planner solves problem (15). Its FOC is

$$\Upsilon^*_\theta + \beta J'_K \mathcal{H}_\theta = 0, \tag{25}$$

where

$$J(K) = u\Big(\mathcal{C}^*(K, \Theta^*(K))\Big) + \beta J\Big(\mathcal{H}(K, \Theta^*(K))\Big)$$

and $\Theta^*(K)$ represents the expropriation rate followed by future planners in the MPE. Differentiating the last equation, we obtain

$$J_K = \Upsilon^*_K + \Upsilon^*_\theta \Theta^*_K + \beta J'_K \Big(\mathcal{H}_K + \mathcal{H}_\theta \Theta^*_K\Big)$$

which, using eq. (25), reduces to

$$J_K = \Upsilon^*_K - \Upsilon^*_\theta \frac{\mathcal{H}_K}{\mathcal{H}_\theta}.$$

Updating this expression and replacing it into eq. (25), we obtain the planner's GEE

$$\Upsilon^*_\theta + \beta \mathcal{H}_\theta \left(\Upsilon^{*'}_K - \Upsilon^{*'}_\theta \frac{\mathcal{H}'_K}{\mathcal{H}'_\theta} \right) = 0. \tag{26}$$

This is similar to the GEE in the political equilibrium, with the exception that there is no political turnover (so p and q do not appear in this expression) and the transfer function is different. This implies that now

$$\Upsilon^*_\theta = u^*_c \Big(I^* + \theta \mathcal{H}_\theta \Big),$$

$$\Upsilon_K^* = u_c^*\Big[(1-\alpha)A + \theta^*\Big(\mathcal{H}_K - (1-\delta)\Big)\Big].$$

Imposing the balanced growth path conditions, $\mathcal{H}_K = \kappa$ and $\mathcal{H}_\theta = \kappa_\theta K$. Replacing these into eq. (26), and re-arranging, we obtain eq. (16) ■

6.6 Proof of Corollary (3.1)

When there is no political instability $p = 1$ and $q = 0$. Then, eq. (13), determining the expropriation rate under the political equilibrium $\bar{\theta}$ reduces to

$$\underbrace{(1-\beta\bar{\kappa}^{1-\sigma})[\tilde{\kappa} + \bar{\theta}\kappa_{\bar{\theta}}] + \beta\bar{\theta}\kappa_{\bar{\theta}}\bar{\kappa}^{-\sigma}\tilde{\kappa}}_{LHS} = \underbrace{-\beta\frac{\bar{\kappa}^{-\sigma}\kappa_{\bar{\theta}}}{n}(1-\alpha)A}_{RHS}. \tag{27}$$

The planner's FOC determining $\bar{\theta}^*$ can be written as

$$\underbrace{(1-\beta\bar{\kappa}^{1-\sigma})[\tilde{\kappa} + \bar{\theta}\kappa_{\bar{\theta}}] + \beta\bar{\theta}\kappa_{\bar{\theta}}\bar{\kappa}^{-\sigma}\tilde{\kappa}}_{LHS} = \underbrace{-\beta\bar{\kappa}^{-\sigma}\kappa_{\bar{\theta}}(1-\alpha)A}_{RHS}. \tag{28}$$

Note that the LHS of eq. (28) is the same as that of eq. (27), whereas the RHS differs for any $n > 1$ implying that $\bar{\theta} \neq \bar{\theta}^*$. Hence, the BG-MPE is inefficient.

To show the second part, evaluate the equations at $\delta = 1$ and $\sigma = 1$. Eq. (27) collapses to eq. (24), studied in Appendix 6.4. The RHS of eq. (27) is larger than the RHS of eq. (24), implying that $\bar{\theta}^* > \bar{\theta}$. Since κ is decreasing in θ, then $\bar{\kappa} < \bar{\kappa}^*$ ■