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Labor Heterogeneity and the Risk of Expropriation in Less Developed Countries

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Philipp an de Meulen[1]

Labor Heterogeneity and the Risk of Expropriation in Less Developed Countries

Abstract

Following the notion of skill-biased FDI flows from developed to less developed regions, high-skilled workers are likely to benefit from FDI to a larger extent. They earn a productivity advantage that potentially transfers into a skilled wage premium. This gives rise to distributional conflict that might turn into heterogeneous attitudes toward FDI inflows in line with skill. In this paper I study the effect of less developed countries' skill compositions on the risk of expropriation. Not surprisingly, it turns out that the risk of expropriation decreases with a larger employment share of high-skilled workers. However, in a theoretical model, the effect is diminishing and even turns negative in the empirical investigation: if the relative supply of high-skilled labor is too large, the skilled wage premium turns negative despite the skill-bias of FDI. Then, high-skilled workers' positive attitudes toward FDI vanish.

JEL Classification: F21, D78, J24

Keywords: International investment; political economy; labor productivity

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1 Introduction

Within the last thirty years the developed world experienced a growing skill premium – the wage ratio of high to low-skilled labor. Contemporaneously, the supply of well educated labor remarkably increased. Acemoglu (2003) states that this simultaneity can only be caused by an increasing demand for high-skilled workers, either because of increased skill-biased technological change (SBTC) or trade liberalization in less developed countries (LDCs). The latter explanation was largely rejected in the literature. Trade in goods would imply a growing skill premium in skill-intensive developed countries, but a shrinking skill premium in skill-scarce LDCs. For the bulk of LDCs, however, there is evidence that the skill premium increased rather than decreased in the wake of trade liberalization. In contrast to trade in *goods*, Feenstra and Hanson (2003) argue that trade in intermediate inputs holds as an explanation of increasing skill premia in *both* developed and less developed regions. Accordingly, enterprises from the north outsource those parts of the production process which are low-skilled labor-intensive from their own perspective but incur technologies that require high-skilled labor from the host countries' perspectives. This explanation underlines the notion of SBTC.[1]

Referring to Feenstra and Hanson (2003), FDI from developed regions should flow to LDCs with a well educated labor force. However, the bulk of international investment takes place in the developed world. Foreign firms shun less developed destinations characterized with low institutional quality. In such an environment investors face the risk of being harassed with corruption, a high regulatory burden, discriminatory taxation or full expropriation. Expropriation risk results from the well-known time inconsistency problem: once foreign capital is installed in the production process it is sunk and cannot be uninstalled at short notice. Ex-post, host country governments thus have an incentive to seize foreign capital.

The aim of the paper is to study the effect of the employment share of high-skilled workers – from now on referred to as *Skill Share* – on the perceived risk of expropriation in an LDC. I combine the large literature strands on skill-biased FDI flows from developed to less developed regions and on the risk of – creeping or outright – expropriation of foreign investors. Given FDI entails advanced technologies that raise the relative productivity of high-skilled labor, this might lead to distributional conflict between workers along educational lines. Accordingly, in an environment of endogenous expropriation risk, the skill share affects the political barrier to capital mobility if a government weighs high- and low-skilled workers' heterogeneous attitudes when deciding on expropriation. Hence, a large skill share should serve as a twofold driver for FDI inflows. First, it creates investment incentives due to large returns to skill-complementary capital. Second, it is likely to diminish the distorting

[1] See Krugman (2000) for support on the factor price effects of factor-biased technological change.

risk of expropriation. In this paper, I show that this is true – unless the skill share is too large. Then, due to diminishing marginal returns to labor, low-skilled labor productivity exceeds the productivity of high-skilled workers despite the skill bias. This might reverse attitudes toward foreign investors and a further increase of the skill share raises the political constraints to inflowing investment and thus has a *negative* effect on FDI inflows. Nevertheless, relating the feasible level of FDI to a benchmark level with secure property rights, a larger skill share alleviates "the extent of expropriation risk".

The paper consists of a theoretical model followed by an empirical investigation to test the model predictions. With the theoretical part I proceed in two steps. First, I derive the equilibrium level of FDI inflows in a benchmark setting with secure property rights. Second, accounting for endogenous expropriation risk, I compute the *incentive-compatible* level of FDI. Therefore, capital inflows must not exceed a threshold, where the host country prefers expropriation over non-expropriation. In both settings, FDI first increases with the skill share but decreases if the relative supply of high-skilled labor is too large. In the benchmark setting, this is where low-skilled labor becomes more productive than high-skilled labor, despite the skill bias of FDI. At this point, low-skilled workers' wage earnings exceed high-skilled workers' rewards. With this wage gap being large enough, the respective groups' attitudes toward expropriation turn around. Then, increasing the number and hence the political weight of the high-skilled part of society eventually fortifies the host country's propensity to expropriate.

The empirical findings support the theoretical predictions. In a sample of LDCs, the effects of different human capital measures on the security of property rights as measured by the "Investment Profile" index, published in the *International Country Risk Guide (ICRG)*[2] are non-linear. The marginal effects first increase, but turn negative with the respective human capital variable being sufficiently large.

The remainder of the paper is organized as follows. In Section 2, I review the literature on expropriation and skill-biased FDI flows. Section 3 presents a theoretical model on labor force skill composition and expropriation risk in a small open LDC. In Section 4, I test the model predictions and explore the effect of the skill share on the security of property rights. Section 5 summarizes the results and concludes. Variable descriptions and descriptive statistics can be found in the appendix.

[2]See Political Risk Services Group (2008).

2 Expropriation and Skill-Biased FDI

2.1 Theory and History of Expropriation

Kobrin (1984) defines expropriation as "the involuntary forced divestment of foreign direct investment". Although expropriations are usually thought of as nationalizations, they might also take creeping forms without ownership takeover. While it is almost impossible to account for all – in many cases subtle – acts of expropriations, Kobrin (1984), Minor (1994) and Hajzler (2008) compiled at least 624 acts between 1960 and 2006 for a large set of non-European developing countries. Although the authors do not list more than 65 acts since 1980, Clark (2003) notes that foreign investors still perceive expropriations as a major threat when investing abroad. Evidently, 49 expropriation acts occurred since 1990.

Basically a government cannot credibly commit to refrain from expropriating private capital as foreign investors cannot appeal to any supranational law when it comes to violation of property rights within a host country's borders. Accordingly, if FDI cannot be withdrawn after its installation, a host government has a clear incentive to expropriate foreign capital. The host country's benefits from expropriation are given by the seized capital stock that can be used for domestic production purposes, generating output, capital and labor income. Moreover, if expropriated capital embodies advanced technological knowledge, the host country might enable spillovers to domestic firms that generate additional benefits (Tomz and Wright 2008). Given the host country's temptation to expropriate, foreign investment should stay away. Nevertheless, we do observe positive FDI flows, even in countries obviously characterized by little security of property rights. This is because host countries do not solely benefit from expropriation.

The costs either arise in form of future punishments (Geiger 1989; Cole and English 1991; Thomas and Worrall 1994; Aguiar et al. 2009; Aguiar and Amador 2009) or if the local government fails to make up for the foreign investor's intangible managerial skills, see Eaton and Gersovitz (1984), Raff (1992), and Harms and an de Meulen (2011) among others. In the former case the host country engages in a repeated interaction with the expropriated foreign investor, other investors or the investor's home country. Expropriation is retaliated by investment or trade embargoes, or by the exclusion from future capital markets. However, embargo threats are not credible, if the expropriated investor himself would suffer from cutting his relationship to the host country (Tomz and Wright 2008; Bulow and Rogoff 1989). Moreover, the threat of an embargo does not work if the host country can rely on capital inflows from third parties. Bulow and Rogoff (1989) argue – albeit in the content of debt default – that a credible embargo threat requires creditors having the necessary political rights to induce their own government to "take retaliatory actions" and legal rights to cut the host country's trade relationships or financial agreements abroad. Then, countries with large

foreign debt would bear a high risk of being punished in the wake of expropriation and thus FDI inflows would be less distorted. Aguiar and Amador (2009) and Aguiar et al. (2009) argue that in times of high debt, capital inflows are low, since then political incumbents have a large temptation to expropriate. Short-term orientated governments need means to repay their debt and to ensure current public spending. Thereby, they do not care too much about future consequences.

Hence, I abstract from retribution as expropriation cost and follow models e.g. by Eaton and Gersovitz (1984) or Raff (1992). They focus on a direct sanction foreign investors can impose on the local economy after expropriation: the withdrawal of their superior technological knowledge in operating a firm. Technological complexity and know-how advantages of multinationals do in fact help to prevent their takeovers (Bradley 1977; Kobrin 1980).

If expropriation is complete, the foreign investor is deprived of the entire capital stock and the ability to control the production process. Naturally, fully losing control, investors do not have the incentive to pay any effort in operating the firm. Consequently, the host country can implement seized capital in domestic production, but is likely to suffer from low productivity due to the missing technological know-how of foreign investors. Then, output and wages are likely to decrease in the wake of expropriation. Wage drops hit domestic workers, but not symmetrically if FDI is skill-biased. Assuming that it is foreign know-how – besides capital – that entails SBTC, the withdrawal of foreign management is likely to affect high-skilled labor far more than low-skilled. Thus, skill-biased FDI inflows cause distributional conflict within the labor force, potentially driving high and low-skilled workers' attitudes toward expropriation in opposite directions.

Modeling the host country's workforce as a predominant group to affect the expropriation decision is highly reasonable in LDCs. First, the workforce forms the vast majority of the population. Unlike developed countries, the young generation enters the workforce at an earlier age and there are no such large population shares of retired cohorts. Second, heterogeneous preferences of workers can well be associated with wage inequality since wage earnings are the main source of workers' income.

In the next subsection I reconsider the literature on skill-biased FDI from developed to less developed regions. As mentioned above, FDI being skill-biased is a prerequisite for *heterogeneous* expropriation preferences between high and low-skilled workers.

2.2 The Role of Labor Heterogeneity: Skill-Biased FDI

Since the 1980s various LDCs experienced remarkable increments in income inequality, e.g. due to skill premia. At the same time many of these economies undertook large steps to open up to international trade, as can be seen from the NAFTA in Latin America or EU accesses of Eastern European countries. In the aftermath, trade in final goods and inputs, FDI and other capital flows increased (Goldberg and Pavcnik 2007; Hanson and Harrison

1995).

Goldberg and Pavcnik (2007) summarize the literature on possible channels through which globalization might have led to increased wage inequality in LDCs. They argue that it was generally driven by increased demand for high-skilled labor. The most striking explanations are linked to the flow of skill complementary production capital from developed to less developed regions. Multinationals outsource production stages that are skill-intensive from the host country's point of view (Feenstra and Hanson 1997, 2003). In developing countries, multinationals rely on high-skilled labor for "senior management positions and key technical and engineering jobs to execute sophisticated or specialized production tasks" (United Nations Conference on Trade and Development (UNCTAD) 1994, p.238). A large skill intensity in foreign affiliates might thus be driven by advanced skill-biased technologies, embodied in foreign capital and know-how flows as shown by Martins (2004) or – albeit for the US – Autor et al. (1998) and Berman et al. (1994). Henry and Sasson (2009) argue that, due to reduced import costs in the wake of capital market integration, the implementation of advanced and skill-biased machinery from abroad increased. Accordingly, if employed by foreign firms, the relative productivity and wage premium of high-skilled workers increases. There is ample empirical evidence that supports this view for less developed host countries, e.g. Lipsey and Sjöholm (2004) for Indonesia, te Velde and Morrissey (2003) for Africa, Pavcnik (2003) for Latin America and Bruno et al. (2004) for Eastern Europe.

Nevertheless, it is not quite clear how the skill bias associated with foreign capital inflows evolves. In general, the academic literature refers to *capital-embodied* technological change (Hanson and Harrison 1995; Acemoglu 2003). However, little is known about the role of managerial knowledge or technical assistance, which might boost high-skilled labor productivity when working with a given capital stock. Note that in the context of expropriation preferences of high and low-skilled workers this is an important issue. If the skill-bias in foreign investment is fully capital-embodied, expropriation and the subsequent withdrawal of foreign (managerial) know-how would not make the skill-bias disappear and might not lead to adverse wage effects of high and low-skilled workers. However, I assume that it is *intangible* foreign knowledge that – at least partly – involves skill-biased productivity and wage effects. Technological knowledge is indispensable to optimally complement "high-tech" capital with the given labor input. The coincidence of advanced managerial knowledge and SBTC is consistent with the literature, albeit in an indirect and slightly different way. First, managerial knowledge shapes firms' productivities in general (Bloom and van Reenen 2007; Burstein and Monge-Naranjo 2009). Second, high productivity enables firms to overcome the fixed (investment) costs to engage in trade, yielding a larger market share (Bernard et al. 2003; Melitz 2003). Third, the engagement in trade induces investment in new skill-biased technologies that help to compensate trade costs (Yeaple 2005; Bustos 2005).

In the next section I present a model that adopts the notion that FDI flows from developed to less developed regions entail capital and advanced technological knowledge. First, this enables foreign firms to use *given* production inputs more efficiently and second, it raises the relative productivity of high to low-skilled labor.

3 A Model of Labor Heterogeneity and Expropriation Risk

In a benchmark setting I assume secure property rights before I proceed to an environment of endogenous expropriation risk. In Section 3.3 I define an extent of expropriation risk μ that relates the unconstrained to the constrained level of FDI. I analyze how μ reacts to changes in the degree of the skill bias and to a growing share of high-skilled labor input.

I assume a less developed small open economy that receives FDI flows from developed regions. The host country government faces a decision to expropriate the foreign capital stock. FDI is skill-biased: it raises the relative productivity of high-skilled labor but lowers the one of low-skilled workers. This induces heterogeneous attitudes toward the political treatment of foreign investors within the workforce. When deciding on expropriation, the government takes these preferences into account. Expropriation only takes place, if high- and low-skilled workers' benefits outweigh the costs that arise from such a decision.

3.1 FDI Flows with Secure Property Rights

The Structure of the Model

The host country is assumed to be populated by two different types of agents, high and low-skilled workers, denoted by H and L, respectively. Individuals only live for one period of time and maximize their respective utilities, which are assumed to be linear in consumption,

$$U_i = c_i \quad \forall\, i = H, L. \tag{1}$$

For simplicity the total population number $H + L$ is normalized to one. Then, H and L can be interpreted as population shares and L can be replaced by $1 - H$. Since the model is static, each worker consumes her entire income, which consists of wage earnings w_i from supplying one unit of labor in the production process. By assumption, the host country does not own any capital itself. Nevertheless, the economy is open to international investment K^*, which domestic production completely hinges on. Foreign investors not only bring in capital but their expertise A^*, e.g. technical assistance for machines or computers. As a result, a given amount of production input can be used more efficiently. Furthermore, foreign knowledge increases the output elasticity of high-skilled workers but decreases that

of low-skilled workers.

At the beginning of the considered period, foreign firms set up subsidiaries in the less developed economy, install their own production capital and employ domestic labor to operate in the host country's market. The production technology of a representative subsidiary is assumed to be of the following Cobb Douglas type

$$Y^* = A^* H^{\alpha+\beta}(1-H)^{\alpha-\beta}\,(K^*)^{1-2\alpha}\ , \tag{2}$$

where $0 \leq \beta < \alpha < 0.5$ and with the asterisk denoting "foreign" variables. Throughout the model output is used as the numeraire. The size of β – denoting the productivity advantage of high-skilled labor – depends on the skill-biased technologies used in production. As indicated above, skill-biased technologies are not capital-embodied in a direct sense: it requires capital *and* expertise to use high-skilled labor inputs more efficiently. Precisely, without advanced technological expertise, the productivity advantage β would drop to zero. This will become important, when it comes to expropriation and the subsequent withdrawal of foreign know-how in an environment of insecure property rights. The assumption of skill-biased technologies increasing the ratio of high to low-skilled labor productivity is standard in the related literature. Acemoglu (2003) takes the adoption of skill-biased technology in production as endogenous explanation of the simultaneous prevalence of a large supply and a large wage level of high-skilled labor. Alternatively, Aghion and Howitt (1998) develop a model where advanced technologies arise from the spread of secondary innovations on a so-called "General Purpose Technology". Secondary innovations require high-skilled labor and, once implemented in production, labor demand is pushed toward high-skilled labor.[3] Moreover, the empirical analyses on the effect of SBTC on the demand for high-skilled labor (Berman et al. 1994) as well as on educational wage inequality (Autor et al. 1998) are guided by the CES version of equation (2) and thus by the idea that SBTC shapes the relative productivity of H to L. While it is common to employ skill-biased technologies using a CES production function, I refer to Cobb Douglas. This does not alter the results but it simplifies analysis and makes it able to derive the main results analytically.

Capital income from production is given by $K^* \cdot (1 + r^*)$, where r^* denotes the return to capital and where the rate of depreciation is assumed to be zero. The wage levels paid for each unit of high and low-skilled labor on a competitive labor market are

$$\begin{aligned} w_H &= A^* \cdot (\alpha+\beta) H^{\alpha+\beta-1}(1-H)^{\alpha-\beta}\,(K^*)^{1-2\alpha} \quad \text{and} \\ w_L &= A^* \cdot (\alpha-\beta) H^{\alpha+\beta}(1-H)^{\alpha-\beta-1}\,(K^*)^{1-2\alpha} \end{aligned} \tag{3}$$

[3]See Aghion (2002) for a competent sketch on theories on SBTC and wage premia.

respectively. The return to capital residually results from a foreign firm's production revenues less labor costs, i.e.

$$r^* = A^* \cdot (1-2\alpha) H^{\alpha+\beta}(1-H)^{\alpha-\beta} \left(K^*\right)^{-2\alpha} \ .$$

The Level of Unconstrained FDI Flows

By assumption, international investors are given an investment alternative on the international capital market which offers the exogenous return R. Then, FDI flows to the less developed host country take place until the return to capital r equals the "world market" return. This yields an equilibrium level of unconstrained international investment K_u^*, i.e. one with secure property rights:

$$K_u^* = \left[\frac{(1-2\alpha)A^*}{R} H^{\alpha+\beta}(1-H)^{\alpha-\beta} \right]^{\frac{1}{2\alpha}} \ . \tag{4}$$

K_u^* will serve as a benchmark to assess the amount of capital market restriction in the setting with endogenous risk of expropriation.

3.2 FDI Flows with Insecure Property Rights

Costs and Benefits of Expropriation

Following the argument of Li (2009) that expropriation decisions are made by chief executive leaders who are primarily office-motivated, I model the expropriation decision as a political process, where the government maximizes its political support among the population.[4] I further assume that expropriations are complete. That means, foreign investors are left without a single unit of capital after expropriation. In case of expropriation the host country government grabs the sunk foreign capital stock *before* production takes place. Then, seized capital can be used for domestic production purposes.

The individual benefits from expropriation arise from a per capita transfer, if at least parts of the accruing production revenues are distributed among the public. Following Eaton and Gersovitz (1984) the costs stem from the fact that foreign investors leave the host country right after expropriation before production starts, taking away their expertise. In terms of my model, the host country bears the cost of lower technological knowledge A instead of A^*. Hence, I assume that $A^* > A$.[5] A is normalized to one.

[4] Allowing for heterogeneous weights of political supports, the political-economic concept of a support-maximizing government may well be adequate even in non-democratic regimes where political influence across social groups is unequal. Moreover, Acemoglu and Robinson (2001) argue that even if some parts of society are not granted political rights, they pose a threat of revolution on the ruling elite. Given this threat, the elite will have to take these groups' political interests into account to prevent revolution.

[5] See Hall and Jones (1999) for evidence on the total factor productivity gap between developed and less developed countries. Additionally, te Velde and Morrissey (2003), Lipsey and Sjöholm (2006), Aitken et al.

The technology withdrawal has two effects on output and wages. First, output directly decreases since the missing expertise lowers *total* factor productivity. Second, it indirectly affects the productivity of high and low-skilled labor. Recalling that the productivity advantage of high-skilled labor requires foreign knowledge, I assume workers' output shares to coincide in domestic production, i.e. $\beta = 0$. Note that the breakdown of the productivity advantage of high-skilled workers in the wake of expropriation is a crucial assumption. If foreign expertise weren't skill-biased or if domestic expertise were equally skill-biased, the withdrawal of foreign know-how would not affect labor productivity in a *different* way and would not arise distributional conflict between differently skilled workers. As a result, high- and low-skilled workers would not have different expropriation preferences and the skill share would not affect the political barrier to FDI inflows from developed regions.

Since the decline of β has different effects on labor productivity, it might even increase output if $H < 0.5$. However, by Assumption 1, I rule out that the withdrawal of foreign expertise entails an output increment, even if H is very small.

Assumption 1

$$A^* > \left(\frac{1-H}{H}\right)^{\beta} .$$

Assumption 1 ensures that foreign expertise is superior, irrespective of the skill share. Then $Y^* > Y_E$, where Y_E denotes production after expropriation, given through

$$Y_E = H^{\alpha}(1-H)^{\alpha}\left(K^*\right)^{1-2\alpha} . \tag{5}$$

Note, that the subscript E denotes variables in case of expropriation. Again, labor and capital are paid their marginal productivity, i.e.

$$\begin{aligned} r_E &= (1-2\alpha)H^{\alpha}(1-H)^{\alpha}\left(K^*\right)^{-2\alpha}, \\ w_{HE} &= \alpha H^{\alpha-1}(1-H)^{\alpha}\left(K^*\right)^{1-2\alpha} \quad \text{and} \\ w_{LE} &= \alpha H^{\alpha}(1-H)^{\alpha-1}\left(K^*\right)^{1-2\alpha} . \end{aligned} \tag{6}$$

Assuming that the *entire* production revenues from seized firms are distributed among the domestic workforce, the per capita transfer t reads as

$$\begin{aligned} t &= \frac{K^* \cdot (1+r_E)}{H+(1-H)} \\ \Leftrightarrow t &= K^* \cdot \left[1+(1-2\alpha)H^{\alpha}(1-H)^{\alpha}\left(K^*\right)^{-2\alpha}\right] . \end{aligned}$$

(1996) and Görg et al. (2007) find wage differentials between foreign and domestic firms in various LDCs attributed to foreign ownership.

To illustrate the impact of expropriation, Figure 1 gives the sequential game between foreign investors and the host country government.[6]

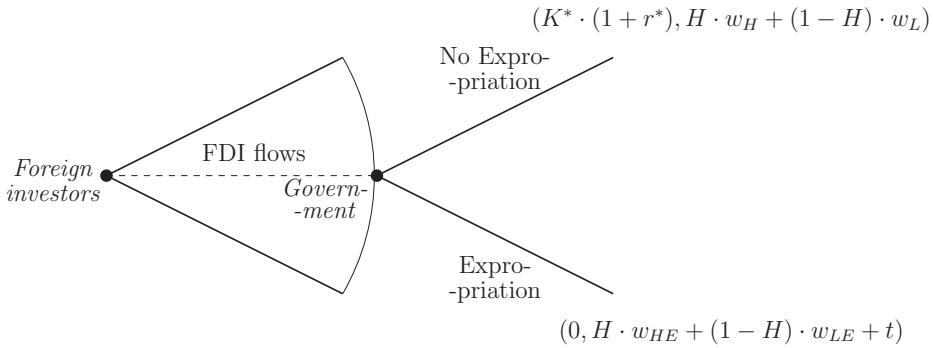


Figure 1: Sequential Game between Foreign Investors and the Host Country Government

From the production functions (2) and (5) and given that capital and labor earn their respective marginal productivities it is possible to derive the costs of expropriation for high and low-skilled workers. First, the technology drop reduces output and thus wage earnings of both high and low-skilled workers by Assumption 1. Second, as stated on the last page, labor productivities of high and low-skilled workers converge as their output shares coincide in the wake of expropriation. As a consequence, wage earnings of high-skilled workers unambiguously decrease (see equation (7)). However, wage earnings of low-skilled workers might even increase for a sufficiently low skill share H and a large enough productivity advantage of high-skilled labor β. Then, low-skilled workers do not benefit from foreign ownership. First, with a low H, the output boost from the existence of skill-biased technological expertise diminishes. Second, a large β reduces the low-skilled labor share of foreign firms' output (see equation (8)).

$$w_H - w_{HE} = \frac{Y_E}{H} \cdot \left((\alpha + \beta) \cdot A^* \left(\frac{H}{1 - H} \right)^{\beta} - \alpha \right) \quad > 0 \tag{7}$$

$$w_L - w_{LE} = \frac{Y_E}{1 - H} \cdot \left((\alpha - \beta) \cdot A^* \left(\frac{H}{1 - H} \right)^{\beta} - \alpha \right) \quad \lessgtr 0 \, . \tag{8}$$

[6]Note that the respective latter payoffs given in Figure 1 do not accrue to the government itself but the host country's labor force.

Incentive-Compatibility: The Level of Constrained FDI Flows

The government decides to expropriate the foreign capital stock if this gains support from the workforce. Political support equals the unweighted sum of workers' utilities.[7] Denoting political support by W in case of no expropriation and W_E else, expropriation will be carried out, if W_E exceeds W, where

$$\begin{aligned} W &= H \cdot w_H + (1-H) \cdot w_L \quad \text{and} \\ W_E &= H \cdot (w_{HE} + t) + (1-H) \cdot (w_{LE} + t) \ . \end{aligned}$$

Since wage earnings and the per capita transfer t add up to the host country's GDP plus capital, political support in case of expropriation simplifies to:

$$W_E = K^* + Y_E \ . \tag{9}$$

Political support for non-expropriation is given by the sum of wage payments from foreign firms. According to their marginal productivity the high-skilled labor wage bill is given by the part $(\alpha + \beta)$ of output, while the group of low-skilled workers earn $(\alpha - \beta) \cdot Y^*$. Thus, it holds that

$$W = 2\alpha Y^* \ . \tag{10}$$

When investing in the host country foreign firms must obey the *non-expropriation constraint* $W_E \leq W$. Using equations (2) in (10) and (5) in (9) the government abstains from expropriation if

$$K^* + H^{\alpha}(1-H)^{\alpha} \left(K^*\right)^{1-2\alpha} \leq 2\alpha A^* H^{\alpha+\beta}(1-H)^{\alpha-\beta} \left(K^*\right)^{1-2\alpha} \ . \tag{11}$$

Inequality (11) has a straightforward interpretation. Expropriation does not take place, as long as production under foreign ownership yields wage earnings that exceed the host country's sum of total production output and capital after expropriation. Secure investment thus requires a high technology advantage of foreign firms $A^* - 1$ and a large skill share H. The latter is necessary for the skill bias to materialize. Only if the bulk of the labor force is high-skilled, the adoption of skill-biased technologies in production has a positive impact on output. In terms of the distributional conflict between high- and low-skilled workers, a smaller skill share increases the political weight of low-skilled workers, whose expropriation propensities are spurred by the relative productivity loss under foreign ownership. Moreover,

[7] By choosing equal weights in the political support function, I follow Acemoglu and Robinson (2001), who argue that even if political rights are restricted, the threat of revolution makes the executive to take all social groups' interests into consideration.

from equation (8), the potential wage loss of low-skilled workers in the wake of expropriation reduces with a declining H, increasing each low-skilled worker's expropriation propensity. Indeed, if H and A^* are too low, the host country's willingness to expropriate might become so large that no FDI flows take place at all. In this case, the productivity gain of high-skilled workers and the technological advantage $A^* - 1$ cannot compensate for the relative productivity loss of low-skilled workers under foreign ownership. This is true if $H \leq \underline{H}$, where

$$\underline{H} = \frac{\gamma}{1+\gamma} \quad \text{with } \gamma = \left(\frac{1}{2\alpha A^*}\right)^{\frac{1}{\beta}} .$$

$\underline{H}$ calculates from solving the non-expropriation constraint (11) for K^* and setting it equal to zero. Note that this lower bound decreases with A^*. If $A^* = 1/(2\alpha)$, $\underline{H}$ would equal 0.5. To assure that FDI inflows are not restricted to zero whenever $H \leq 0.5$, I introduce Assumption 2.

Assumption 2

$$A^* > 1/(2\alpha) .$$

Given investors know the expropriation decision rule and workers' preferences, incentive-compatible FDI flows solve $W = W_E$. To explain why, I solve the non-expropriation constraint (11) for K^*. This yields

$$K^* \leq \kappa \equiv \left[2\alpha A^* H^{\alpha+\beta}(1-H)^{\alpha-\beta} - H^{\alpha}(1-H)^{\alpha}\right]^{\frac{1}{2\alpha}} .$$

Hence, the non-expropriation constraint is an upper bound rather than a lower bound for FDI. K^* must *not* exceed the threshold κ that solves $W = W_E$ to escape expropriation. Furthermore, it would not be optimal to invest less than κ from foreign firms' point of view, if κ is lower than K_u^*, the level of FDI flows, foreign firms would invest in an unrestricted environment. A sufficient condition for this to be true is made by Assumption 3 which I assume to be fulfilled.

Assumption 3

$$1 + R < \frac{1}{2\alpha} .$$

As a result, FDI flows into the less developed host country until the political supports for expropriation and non-expropriation even out. Thus, κ gives the *constrained* level of FDI K_c^*. Since κ is negative, if $H \leq \underline{H}$, K_c^* reads as

$$K_c^* = \begin{cases} \left[2\alpha A^* H^{\alpha+\beta}(1-H)^{\alpha-\beta} - H^{\alpha}(1-H)^{\alpha}\right]^{\frac{1}{2\alpha}} & \text{if } H > \underline{H} \\ 0 & \text{if } H \leq \underline{H} . \end{cases} \tag{12}$$

Skilled Labor Supply and the Level of Constrained FDI Flows

In this paragraph I analyze how the level of constrained FDI flows is affected by a change in the skill share. From equation (12) additional capital flows are feasible if

$$2\alpha A^* \frac{\partial\big(H^{\alpha+\beta}(1-H)^{\alpha-\beta}\big)}{\partial H} - \frac{\partial(H^{\alpha}(1-H)^{\alpha})}{\partial H} > 0\,. \tag{13}$$

Note that equation (13) holds true if the non-expropriation constraint (11) is relaxed by an increasing skill share, i.e. if

$$\frac{\partial(W - W_E)}{\partial H} > 0$$

for given K^*. From inequality (11) this is true if

$$\frac{\partial\big(2\alpha A^* \left(K^*\right)^{1-2\alpha} H^{\alpha+\beta}(1-H)^{\alpha-\beta}\big)}{\partial H} - \left(\frac{\partial K^*}{\partial H} + \frac{\partial\big(H^{\alpha}(1-H)^{\alpha}\left(K^*\right)^{1-2\alpha}\big)}{\partial H}\right) > 0\,.$$

Naturally, with a given K^*, $\partial K^*/\partial H$ equals zero and the above inequality simplifies to equation (13).

To interpret equation (13), the first term on the left hand side is the partial derivative of W divided by $\left(K^*\right)^{1-2\alpha}$ with respect to H, while the latter term denotes the partial derivative of W_E divided by $\left(K^*\right)^{1-2\alpha}$ with respect to H. To illustrate the effect of the skill share on the non-expropriation constraint and thus K_c^*, Figure 2 shows the levels of $2\alpha A^* H^{\alpha+\beta}(1-H)^{\alpha-\beta}$ and $H^{\alpha}(1-H)^{\alpha}$ for different levels of H. The difference of the latter terms gives the constrained level of FDI flows to the power of 2α.[8] As long as this term increases with the skill share, inequality (13) holds and the non-expropriation constraint (11) is relaxed by an increasing skill share. From Figure 2 this is true as long as H does not exceed the threshold level H^{crit}.

At first sight, inequality (13) holds for all levels of the skill share. First, $2\alpha A^*$ is larger than one by Assumption 2. Second, due to the skill bias with foreign ownership, each additional employment of high-skilled labor entails a relative *productivity effect*. Since skill-biased technologies are intangible, the host country's costs from expropriation increase with a larger skill share. In other words, a larger H increases the political weight of the group that benefits from higher relative productivity under foreign ownership. It is therefore surprising that K_c^* does *not* increase with H for all H.

To explain this, I first use equations (3) and (6) to write inequality (13) as

[8] Figure 2 rests upon an exemplary parameter constellation, chosen to meet the Assumptions made throughout the paper: $\alpha = 0.4$, $\beta = 0.2$ and $A^* = 100^{\beta} \approx 2.51$. However, the qualitative results solely hinge on the Assumptions made in the paper. Admittedly, in Figures 2, 3 and 4, $1 - H$ is limited to ≈ 0.99 to not violate Assumption 1.

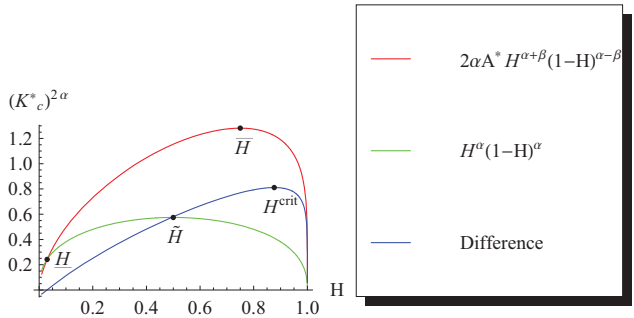


Figure 2: Effects of the level of H on Political Support

$$2\alpha\,(w_H - w_L) - (w_{HE} - w_{LE}) > 0\ . \tag{14}$$

Wage earnings reflect marginal productivities of labor inputs. The wage differences in the upper inequality thus give the output productivity changes of a marginal increase of the skill share. After expropriation, total income from production is distributed to the workforce. Hence, the latter bracket in inequality (14) reflects the effect of changes in the skill share on the political support W_E. In case of foreign ownership, however, returns to capital accrue to the investors. Accordingly, the marginal effect of H on political support W is the wage difference $w_H - w_L$ multiplied by workers' aggregate output share 2α.

After expropriation, both types of workers are equally productive. Output productivity and thus political support for expropriation increases with the skill share if $H < 0.5$ and decreases otherwise. Intuitively, if $H < 0.5$, high-skilled workers earn a higher wage after expropriation. Increasing the fraction and thus the political weight of this group would entail higher political support for expropriation. This is the result of what one can call a *labor supply effect*. This can be seen in Figure 2: $H^{\alpha}(1-H)^{\alpha}$ and thus W_E are maximal if the number of high and low-skilled workers even out ($H = \tilde{H} \equiv 0.5$).

Without expropriation there is an additional relative productivity effect on output if the skill share becomes larger. As shown in Figure 2, both $H^{\alpha}(1-H)^{\alpha}$ and $2\alpha A^* H^{\alpha+\beta}(1-H)^{\alpha-\beta}$ and thus W_E and W increase in H in the range between $\underline{H}$ and $\tilde{H}$, but W grows at a larger rate. Moreover, the relative productivity advantage of high-skilled workers implies, that the effect of H on political support W does not turn negative until H exceeds $\bar{H}$. With further high-skill employment, however, the productivity effect is offset by the labor supply effect. Then, due to diminishing returns to labor, w_L exceeds w_H despite skill-biased technologies in production. As a result, each further increase of the skill share and hence the political weight of high-skilled workers results in lower political support for non-expropriation W. Since $W = 2\alpha Y^*$, $\bar{H}$ also maximizes output under foreign ownership and I can derive

$$\begin{aligned} \frac{\partial\left(H^{\alpha+\beta}(1-H)^{\alpha-\beta}\right)}{\partial H} &= 0 \\ \Leftrightarrow \qquad \bar{H} \equiv \frac{\alpha+\beta}{2\alpha} &= H\ . \end{aligned}$$

$\bar{H}$ is smaller than one as long as $\beta < \alpha$, i.e. as long as low-skilled labor is at least *somehow* productive under foreign ownership of firms. Not surprisingly, if that was not the case, raising input H would always increase output and political support for non-expropriation. Moreover, $\bar{H}$ exceeds 0.5 since β is strictly positive, i.e. due to the skill bias involved in foreign ownership. As a consequence, there is always a strictly positive range of H with $\tilde{H} < H < \bar{H} < 1$, where an increase in the skill share only raises output, the wage bill and thus welfare under *foreign* ownership. In this range, W increases but W_E decreases with H.

As long as further employment of high-skilled labor increases foreign firms' productivity, advanced foreign knowledge A^* enhances this positive effect. Nevertheless, if H exceeds $\bar{H}$, the negative labor supply effect outweighs the productivity effect and foreign expertise also reinforces the overall negative effect of additional high-skilled labor input. If H passes H^{crit} the latter effect is even so strong that a marginal increase of H creates larger productivity losses under foreign than under domestic ownership. As a result, political support for non-expropriation decreases more than political support for expropriation and the marginal effect of H on FDI inflows reverses if the skill share exceeds H^{crit}.[9]

3.3 Skilled Labor Supply and Expropriation Risk

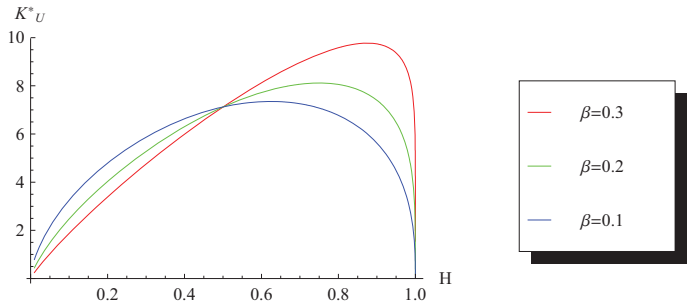
In the last section I have shown that a larger skill share first lowers the barrier to international FDI flows but distorts inflowing FDI if the relative supply of high-skilled workers is too large. Does this result imply, that – like the constrained level of FDI flows – the risk of expropriation does not monotonously decrease in H? To answer this question, I proceed as in Harms and an de Meulen (2011) and define a measure μ, with

$$\mu = 1 - \frac{K_c^*}{K_u^*}\ , \tag{15}$$

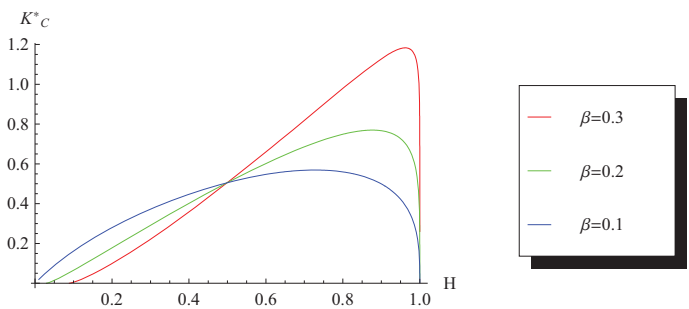
that denotes the "extent of expropriation risk". μ takes on values between zero and one. It is lower than one, since K_c^* and K_u^* cannot be negative and it is positive since the non-expropriation constraint is binding ($K_u^* > K_c^*$) by Assumption 3. Using equation (15), I now analyze how expropriation risk is affected by the skill share H. Moreover, I investigate how the effect of H on expropriation risk hinges on the productivity advantage β of high-skilled labor. Figure 3 demonstrates that β has an increasing (decreasing) effect both on

[9] Although I cannot solve for H^{crit} analytically, it unambiguously exceeds $\bar{H}$, since the inequality in (14) holds for $H = \bar{H}$.

the constrained and the unconstrained level of FDI, if $H > 0.5$ ($H < 0.5$).[10] Furthermore, with a larger β, both functions skew to the left.



(a) Effect of H on K_u^*



(b) Effect of H on K_c^*

Figure 3: Effect of H on K_u^* and K_c^* for different levels of β

In Figure 3(a), K_u^* is maximal, if Y^* is maximal. From equation (10) this is the case if H takes on a level which maximizes W, i.e. $\bar{H} \equiv (\alpha + \beta)/2\alpha$. Thus, if β equals zero, capital productivity in the host country's production process and hence FDI is maximal if $H = 0.5$. This is due to the mere labor supply effect. However, with $\beta > 0$, the additional relative productivity effect emerges. Low-skilled workers suffer from a relative productivity loss, high-skilled workers benefit from higher relative productivity. Output, marginal productivity of capital and thus capital inflows increase (decrease) if the majority of the labor force is high-skilled (low-skilled). Naturally, a larger relative productivity effect shifts labor demand toward high-skilled workers and moves the "capital productivity maximizing" labor input combination to a point where H exceeds 0.5. Evidently, $\bar{H}$ is a positive function of β.

With constrained FDI flows (Figure 3(b)), the productivity effect only appears in the absence of expropriation. As stated above, this effect has a negative influence on foreign

[10] In Figures 3 and 4 again, I set $\alpha = 0.4$ and $A^* = 100^\beta \approx 2.51$. Moreover I assume $R = 0.06$, a reasonable calibration that fulfills Assumption 3.

firms' output if the majority of workers is low-skilled. In this case, productivity losses of low-skilled workers cannot be compensated by the gains of high-skilled workers. Political support for non-expropriation decreases in β and thus FDI flows drop down. Naturally, if $H > 0.5$, the productivity gains of high-skilled workers overstate the losses of low-skilled workers and β has a positive effect on K_c^*. If there was no productivity effect, the constrained level of FDI flows would be maximal where $H = 0.5$. This is the point where the labor supply effect becomes maximal and – due to the technology advantage $A^* - 1$ of foreign investors – the output difference $Y^* - Y_E$ and thus political support for non-expropriation is maximized. However, if β is positive, the latter difference further increases with H even for $H > 0.5$. While w_{LE} exceeds w_{HE} and thus political support for expropriation decreases with the skill share once it exceeds the share of low-skilled workers, the relative productivity effect compensates for the negative labor supply effect in case of foreign ownership until $H = \bar{H}$. This was discussed in the last section and illustrated in the corresponding Figure 2. The level of constrained FDI flows increases until H equals H^{crit}, which exceeds 0.5 if β is positive.

Using equations (4) and (12), μ reads as

$$\mu = 1 - \left[\frac{\left(2\alpha A^* \left(\frac{H}{1-H}\right)^{\beta} - 1\right) R}{(1-2\alpha)\, A^* \cdot \left(\frac{H}{1-H}\right)^{\beta}} \right]^{\frac{1}{2\alpha}} . \tag{16}$$

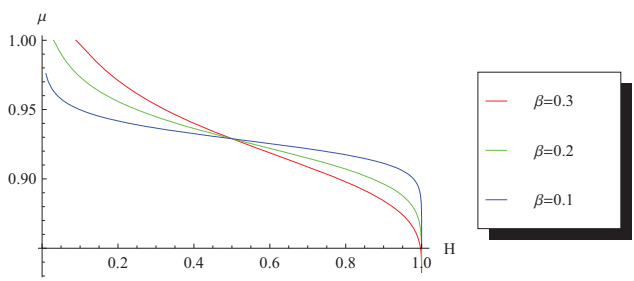


Figure 4: Effect of H on the risk of expropriation for different levels of β

The effect of H on the risk of expropriation for different levels of β is illustrated in Figure 4. Taking the derivative of equation (16) with respect to H, one can see that μ monotonously decreases with H for all levels of $H \in [\underline{H}; 1[$. This is because the elasticity of K_c^* with respect to changes of H is always larger than that of K_u^*. This can be illustrated as follows. K_u^* equalizes the world market return R and the return to investment in the host country, r^*. Rearranging equations (2) and (4) yields

$$\frac{K_u^*}{Y^*} = \frac{1-2\alpha}{R} \,. \tag{17}$$

Hence, in the benchmark equilibrium the fraction of FDI to the host country output has to equal the constant ratio of the capital share of output in the host country market $(1-2\alpha)$ and the world market return R. Conversely, K_c^* equalizes the political supports of the domestic workforce for expropriation and non-expropriation. Using equations (9) and (10) the constrained level of FDI flows as a share of Y^* solves

$$\frac{K_c^*}{Y^*} = 2\alpha - \frac{Y_E}{Y^*} \,. \tag{18}$$

The elasticity of K_c^* to changes of H is larger than that of K_u^* since a marginal increase of H has an effect on both Y^* and Y_E. This can be seen from Figure 2. First, with $H < 0.5$, both Y_E and Y^* increase with H. However, due to the additional productivity effect, the effect on Y^* is larger and Y_E/Y^* decreases. The preference for non-expropriation increases and the reaction of K_c^* to the increasing skill share is larger than that of K_u^*. This can also be seen from equation (18): in addition to the increase of Y^* on the left hand side, the decrease of Y_E/Y^* on the right hand side induces further FDI inflows K_c^*. Second, in the range of $\tilde{H} < H < \bar{H}$, Y^* increases while Y_E decreases. This induces a higher preference for non-expropriation and additional FDI flows are feasible. Moreover, since Y_E/Y^* declines, the increase of K_c^* exceeds the increase of K_u^*. Third, with a level of H between $\bar{H}$ and H^{crit}, a marginal increase of the skill share decreases Y^* and Y_E. While FDI reduces in an environment with secure property rights, the constrained level of FDI flows still increases with H. Fourth, with $H > H^{crit}$, both K_c^* and K_u^* decrease with H. However, the negative reaction of K_u^* is larger. While in a setting of secure property rights the decline of Y^* lowers the returns to investment and thus leads to reduced FDI flows, the decline of Y^* is weakened by the decline of Y_E in an environment of endogenous expropriation risk.

Similarly, the effect of β on μ is positive if $H > 0.5$ but negative if $H < 0.5$. Starting with the latter case, a growing β does not affect Y_E, but it reduces output under foreign ownership, since the number of workers that "lose" productivity exceed the number of high-skilled beneficiaries. Accordingly, both investors with and without facing the risk of expropriation react by decreasing their investment, K_c^* and K_u^* respectively. However, as can be seen from equation (18), the relative decrease of K_c^* is larger than that of K_u^* as Y_E/Y^* increases with β given $H < 0.5$. Naturally, the latter effects all turn around if $H > 0.5$ and therefore Y^* increases with a larger productivity advantage of high-skilled workers β. Then, the relative increment of K_c^* exceeds that of K_u^* as Y_E/Y^* now decreases with β.

Summing up, while a larger skill share attenuates the risk of expropriation, if – to the disadvantage of low-skilled labor – foreign ownership of firms endows high-skilled workers with a larger productivity, the productivity advantage of high-skilled labor β does not have

a positive effect on the security of property rights until high-skilled labor constitute the majority of the workforce.

4 Empirical Investigation

In this section I test the predictions of the model in an empirical investigation and explore if and how foreign investors' property protection is affected by host countries' human capital stocks. Note that the theoretical results hinge on some interior mechanisms. First, FDI is skill-biased, which leads to distributional conflict between high and low-skilled workers. Second, the skill bias diminishes with the skill share. Third, distributional conflict drives individual attitudes toward foreign investment in opposite directions. Fourth, these heterogeneous attitudes affect the government's expropriation decision.

In the empirical investigation I account for these mechanisms in various ways. Following the notion that skill-biased technologies are enclosed in outsourced activities to developing countries, the country sample excludes high-income countries. Moreover, to isolate the effect of skill composition I control for other sources of heterogeneity, such as demographic structure, that potentially drive the political decision on expropriation. Furthermore, I control for several political and institutional variables. Heterogeneous preferences - e.g. due to skill differences - do not transfer into political decisions if the public is not granted the necessary political rights. Most importantly, however, is the choice of variables that best measure host countries' skill shares and the risk of expropriation. Concerning the former no universal and clearcut division between high and low-skilled labor exists. Furthermore, this division is just a shortcut for countries' continuous skill distributions to simplify the model analysis. Hence, the results of the model can be interpreted in a way that the risk of expropriation is lowered with the host country's human capital stock. Thus, I employ education measures that serve as proxies for human capital. A suitable variable comes from Barro and Lee (2001). It gives the average number of years of school attendance of inhabitants aged above 25 years. Hence, it refers to individuals in an employable age and it is a useful proxy for countries' human capital stocks. However, since years of school attendance in LDCs have been rising constantly over the time span chosen in the empirical analysis, a rising number of years of schooling over time does not necessarily coincide with an increasing human capital stock, if it falls back the average increment of years of schooling over time. Thus, for each country, I substract the absolute number of years of schooling in period t from the average level of school attendance over all countries within the sample in t. In Section 4.2 I elaborate on two other education measures which I employ to check the robustness of the results with "schooling". Last I need a proxy to account for expropriation risk. This is because expropriation risk, as defined in the theoretical part relates the constrained level of FDI flows to a *hypothetical* benchmark level with secure property rights that cannot be

measured empirically. A useful proxy is given by the "Investment Profile" index (Political Risk Services Group 2008).[11] It rates governments' attitudes to inward investment and thus is a qualitative assessment of the perceived "security of property rights".

According to the theoretical results, I presume that in a sample of LDCs higher labor quality has an alleviating effect on the perceived risk of expropriation. However this effect may differ with the amount of human capital, giving rise to potential non-linearity as foreshadowed in Section 3.3 (see Figure 4).

4.1 Specification and Data

The sample consists of 79 non-developed countries for the years 1984 to 2005. Countries are chosen according to their respective "income classifications", assessed by the World Bank (2008).[12] Correspondingly, a country in a given period is included, if it is classified worse than "upper middle income country". The chosen time span is due to the availability of the *International Country Risk Guide*'s data on the "Investment Profile" index. I divide the time frame into 5 periods (1984-1985, 1986-90, 1991-95, 1996-2000, 2001-05). Thus, from annual data – if available – I computed a two-year average and five-year averages from 1986 on. The reason for this division is twofold. First, not all data is collected on an annual basis and second, the mean calculation helps to iron out short-run fluctuations in countries' perceived security of property rights and its potential determinants, that might skew the results. The empirical results are based on estimating equation (19).

$$\text{IPROFILE}_{it} = \beta_0 + \beta_1 \cdot \text{HUMAN CAPITAL}_{it} + \sum_{j=2}^{k} \beta_j \cdot x_{j,it} + \xi_t + \epsilon_{it} \; . \qquad (19)$$

As stated above, the dependent variable IPROFILE reflects the "perceived" risk of expropriation based on the qualitative assessments from the *International Country Risk Guide*'s "Investment Profile" index. HUMAN CAPITAL is a wildcard for different measures of countries' human capital endowments. The subscripts i and t denote country and time indices, respectively. Standard errors are based on a robust covariance matrix that controls for heteroscedasticity and serial correlation of errors at the country-level. In the next section I present the regressors that enter into equation (19). Referring to the related literature, I discuss their respective effects on IPROFILE and potential correlations with HUMAN CAPITAL.

[11] The "Investment Profile" index assesses the likelihood of a broad spectrum of outright or creeping expropriation, namely: (a) the risk of expropriation or contract viability, (b) payment delays and (c) barriers to the repatriation of profits. Each sub-component is scored on a scale from zero (denoting very high risk) to four (denoting very low risk). Hence, the optimal Investment Profile is reflected by a score of 12 points.

[12] Countries are classified with respect to GNI per capita. Computations are based on the World Bank's Atlas method (World Bank 2009).

4.2 Independent Variables

The main focus of the empirical investigation lies on the effect of countries' labor quality (HUMAN CAPITAL) on the perceived security of property rights (IPROFILE). I check the robustness of this effect by using three different human capital measures. Since human capital cannot be measured directly, I refer to education variables as proxies for the quality of the labor force. The variables either refer to the de-meaned years of school attendance (DE-MEAN SCHOOLING), school enrollment (ENROLL(-1)) or school qualifications within the labor force (LABOREDUC). As stated above, DE-MEAN SCHOOLING is taken from Barro and Lee (2001) which gives the de-meaned average number of years of school attendance of inhabitants aged above 25 years. Since data on school attendance is only drawn every fifth year, I relate observations from 1980, 1985 etc. to subsequent five-year averages. Second, LABOREDUC based on the World Bank (2009) measures the share of the labor force, that has at least primary education while third ENROLL(-1) is the lagged value of the "gross ratio of total primary enrollment, regardless of age, to the population of the age group that officially corresponds to" primary education taken from the World Bank (2009). The logic behind taking lagged values of this variable is that it refers to children who must grow up before their education can affect the human capital stock of the workforce. Hence, all three variables refer to individuals' past schoolings. Thereby, I can rule out potential problems of reverse causality with the dependent variable.

The control variables can be grouped into institutional variables, macroeconomic variables as well as country and time fixed effects. Furthermore I include a demographic variable YWORKERS[13] – the ratio of young workers (15-39 years old) to old workers (40-64 years old) –, arguing that the age structure of the labor force is likely to affect the security of property rights: younger workers differ from older workers e.g. with respect to their time horizons and their amount of accumulated savings. Thus older workers do not solely hinge on wage income but on domestic firms' capital returns, if – due to rudimentary financial systems in LDCs – savings transform into *domestic* investment. Then older workers suffer less from the withdrawal of foreign knowledge in the wake of expropriation. They are less affected by the subsequent wage drops and even benefit from reduced competition and higher capital returns of domestic firms. Furthermore, with a shorter time-horizon, older generations do not care that much about long-term consequences of expropriation, arising, e.g. from investment embargoes (Li 2009; Harms and an de Meulen 2011; Minor 1994). Most importantly, however, different age groups might well be endowed with different amounts of human capital. Thus, it is important to control for YWORKERS to rule out endogeneity problems.

[13]This variable is taken from the United Nations Population Division (2008). As with DE-MEAN SCHOOLING, observations are only available every five years.

I employ several variables to control for host countries' political institutions. Democratic regimes that entail a broad representation of public interests and go along with political constraints are likely to prevent unpopular expropriations (Stasavage 2002; Li and Resnick 2003; Jensen 2003; Jensen 2008; Li 2009). Naturally, workers' heterogeneous attitudes toward expropriation do not affect the security of property rights if the local government does not take these interests into account. Moreover, the enforceability of its decisions hinges on the support of opposition parties and the judiciary, which might defect the expropriation decision and protect foreign properties in court. However, if opposing elites and lobbying local enterprises create an investor-hostile mood within the population, the risk of expropriation is likely to be higher with democratic institutions (Wells 1998). Furthermore, in democratic regimes, the executive usually has a shorter expected tenure, fading out long-term consequences from expropriation.[14] To account for the "democracy effect", I use the "Political Rights" index determined by Freedom House (2009), which I denote by POLREPRESS. The "Political Rights" index considers (a) the degree of freedom in the electoral process, (b) the amount of party pluralism and the right of political participation and (c) the functioning of the government. The index takes on values between 1 and 7 points, where the scale is reversed since *lower* scores are given to countries that grant *larger* political rights. Thus, the effect of POLREPRESS is *negative* if the alleviating mechanisms on the risk of expropriation prevail. As indicated above, the security of property rights does not only depend on the amount of political rights assertion, but in how far the executive is controlled by an independent judiciary and a powerful opposition in parliament. Thus, I control for two further institutional variables, "Government Stability" (GOVSTAB) and "Law and Order" (LAWORDER). Both measures are taken from Political Risk Services Group (2008). The "Law and Order" index measures domestic courts' strength to enforce existing laws and compliance with laws among the population. Government Stability subsumes amounts of Government Unity, Legislative Strength and Popular Support. It measures "the government's ability to carry out its declared program(s) and its ability to stay in office" (Political Risk Services Group 2008). I expect both variables to have a positive effect on IPROFILE.

Another group of variables that is likely to determine the security of property rights is a country's economic condition, e.g. measured by GDP per capita. In the literature there are two opposing views concerning the role of per-capita income on the risk of expropriation. The first one refers to the argument that expropriations follow opportunistic viewpoints. Expropriations are more profitable in times of economic prosperity and high foreign firms' revenues (Duncan 2006; Picht and Stüven 1991; Tomz and Wright 2008). The second line of reasoning concerns expropriations out of exacerbation in times of economic recessions:

[14] See Li (2009) on the positive effect of leadership turnover on the number of expropriations.

host countries are in need of additional means to relieve hardship. Furthermore, in bad economic situations, public discontent might get the executive to scapegoat foreign investors, all the more if they outperform domestic competitors (Burton and Inoue 1987; Picht and Stüven 1991; Jodice 1980). The ambiguity of the effect of economic wellbeing on the risk of expropriation is emphasized by Jodice (1980) and Li (2009), who find the effect to be curvilinear. While rich, developed countries find alternative ways to benefit from FDI, the poorest LDCs cannot make up for the foreign firms' means and know-how. Accordingly, the direction of the latter effect is ambiguous. To account for potential non-linearity, both the natural logarithm of countries' real per-capita income and countries' growth rates of real GDP[15] are included. Since a low security of property rights is likely to deter foreign investment inflows and thus GDP and growth of the host country[16], I use one-period-lagged values, i.e. GROWTH(-1) and INCOME(-1).

Following the argument that expropriations are likely in times of economic crises (Jodice 1980), a high inflation rate is likely to spur the risk of expropriation as it shows economic failure. To mitigate the influence of high-inflation outliers I use the *logarithm* of the average CPI-inflation rate (INFLATION) as regressor and expect a negative effect on IPROFILE. The data is taken from World Bank (2009). A further variable I control for is trade openness, i.e. the sum of exports and imports as a percentage to GDP. It is likely to have a positive impact on IPROFILE as more open economies are exceedingly exposed to punishments by their trading partners in the wake of expropriation. Note that in turn, a low "Investment Profile" index might deter trade flows. To solve this potential problem of reverse causality I use lagged values of OPENNESS(-1).

I further include several country "fixed effects". Referring to the findings that the bulk of expropriation acts occurred in extraction industries (Jodice 1980; Duncan 2006), OIL and RAWMAT, taking on values "1" for countries that are main exporters of oil or of raw materials other than oil, are likely to have a negative effect on the "Investment Profile" index as firms in resource extraction sectors are attractive expropriation targets.[17] First, much of the investment is sunk before production starts and second, host countries do not have to fear large punishments, since the world relies on good trade relationships to countries that provide the exhaustible resource. LATITUDE is a further dummy variable. This regressor – measuring countries' distance from the equator – controls for unobserved heterogeneity not covered by other regressors.

Last, I include a time-fixed effect for each period covered in the regressions, and the following regional dummies: SUB SAHARAN AFRICA, LATIN AMERICA & THE

[15]The data is taken from the Penn World Table.

[16]See Hall and Jones (1999), Rodrik et al. (2004), Easterly and Levine (2003) and Acemoglu et al. (2001).

[17]The two sets of resource-exporting countries are collocated from the sample of oil-exporting countries in Morsy (2009) and the variable "Exporter of non-fuel primary products" from the World Bank (1995).

CARIBIC, EUROPE & CENTRAL ASIA, EAST ASIA & PACIFIC, MIDDLE EAST & NORTH AFRICA and SOUTH ASIA.

4.3 Results

In this section I present the results of estimating equation (19) with OLS and fixed effects. In the first section, the specifications are linear. In the second section, I account for a nonlinear effect of countries' human capital stock on the security of property rights. To check the robustness of the results with OLS and fixed effects I use ordered logit and ordered probit as alternative methods to estimate the nonlinear specifications in Section 4.3.3. Making use of ordered logit and ordered probit is reasonable since the "Investment Profile" index is based upon qualitative ratings of experts according to a – potentially *ordinal* – 12 points scale. All types of regressions are run with three different measures for HUMAN CAPITAL, which are DE-MEAN SCHOOLING, LABOREDUC and ENROLL(-1).

4.3.1 Benchmark Regressions

Table 2 shows the results of estimating equation (19) with pooled OLS and fixed effects. The first three columns give the regressors' coefficients and standard errors with OLS. Columns 4-6 give the results based on fixed effects estimation. Columns 1 and 4 include DE-MEAN SCHOOLING, columns 2 and 5 use LABOREDUC and in the respective last columns I employ ENROLL(-1).

The coefficients of the institutional control variables well reflect the presumptions made in Section 4.2. The effects of GOVSTAB and POLREPRESS are significant throughout all estimations. The coefficients of GOVSTAB have the expected positive signs. While the effect of democratic regimes on expropriation risk in the literature are ambiguous, I exclusively find negative coefficients of POLREPRESS. Countries with strong and democratic governments are associated with a higher perceived security of property rights. In turn, the impact of strong and independent judiciaries is less pronounced. LAWORDER is ambiguous and not significant, no matter which human capital measure and estimation method I adopt. Turning to the macroeconomic variables, economic prosperity indeed seems to have a nonlinear effect on the security of property rights, as shown in Li (2009) and Jodice (1980). While the coefficients of GROWTH(-1) are significantly positive in all columns, the effect of INCOME(-1) is ambiguous and even significantly negative using fixed effects estimation and LABOREDUC as human capital measure. Moreover, a high inflation rate seems to spur the risk of expropriation except for the inclusion of LABOREDUC.[18] Inflation exacerbates economic hardship in times of recessions. This might spur public discontent and the will to seize foreign firms. In turn, the effect of trade openness is insignificant in all estimations.

[18] In this case however, the number of observations drops to 73, giving rise to a potential selection bias.

Accordingly, the risk of future punishments and indirect sanctions from third parties seem to play a minor role when it comes to the expropriation decision.

Most importantly, the impact of HUMAN CAPITAL on the security of property rights confirm the predictions of the theoretical model sketched above. Throughout the estimations, the coefficients show a positive sign. With OLS, the effects are significant no matter which education variable is chosen. However, the economic significance of HUMAN CAPITAL seems to be small. It needs another five years of de-meaned averaged school attendance to increase a country's "Investment Profile" index by one point. Analogously, a 10% increase in the labor force share with primary, secondary or tertiary education increases the perceived security of property rights by no more than 0.17 points.

4.3.2 Nonlinear Effects

In Section 3, I have analyzed the effect of the skill composition of the domestic workforce on inflowing FDI in an LDC. With skill-biased FDI flows, the defined extent of expropriation risk was shown to monotonously decrease in the ratio of high to low-skilled workers, but in a non-linear way.

To account for potential non-linearity, I now add the squared term of the respective human capital variable to the regressions with OLS and fixed effects estimations (see Table 3). In the theoretical model, the marginal effect of H on μ first diminished until $H = 0.5$ and then increased (see Figure 4). This does not allow an unambiguous prediction of the sign of the squared human capital term. Nevertheless, constrained FDI inflows – which result from endogenous expropriation risk – are less attracted by a well-educated labor force the higher the supply of high-skilled workers. This gives rise to a positive but decreasing marginal effect of HUMAN CAPITAL.

Among the control variables the results confirm those in the linear benchmark specification. The effect of GROWTH(-1) is positive and significant in all regressions, while INCOME(-1) has no clear impact on IPROFILE. The role of economic prosperity is emphasized by the negative coefficients of INFLATION, mostly significant at the 1% level. Furthermore, government stability and the assertion of political rights in LDCs convey a perception of secure property rights of foreign investors.

Turning to the human capital variables, I have calculated marginal effects for each of the estimations. In all six estimations shown in Table 3, the marginal effects are evaluated at the sample means of the respective human capital variable. The intercepts[19] of the marginal effects are all positive, and mostly significant. Moreover, except for SCHOOLING SQUARED with fixed effects estimation, the coefficients of the squared terms are *negative*, but only significant for DE-MEAN SCHOOLING with pooled OLS and for LABOREDUC

[19]The intercepts are given by the coefficients of DE-MEAN SCHOOLING, LABOREDUC and ENROLL(-1), respectively.

with fixed effects estimation. With OLS, the marginal effects are positive and mostly significant, even at the 1% level. Hence, using OLS, it turns out that a larger high-skilled labor supply alleviates the risk of expropriation, but likely at a decreasing rate. On the contrary, controlling for unobserved between-country variation with fixed effects estimation, the results are less clear-cut, since the marginal effects of all three human capital variables are insignificant.

4.3.3 Alternative Estimation Methods: Ordered Logit and Ordered Probit

As indicated in Section 3.3, IPROFILE stems from the *qualitative* "Investment Profile" index. Thus the ratings are subjective and only reflect a *perception* of investors' property rights protection. Moreover, they are measured according to an *ordinal* 12 points scale. To account for this, I now make use of Ordered Logit and Ordered Probit to check the robustness of the results with nonlinear human capital effects shown in Table 3. Therefore, I slightly reassess the dependent variable and round the five-year averaged observations of the "Investment Profile" to pool them into the original 12 point scale. Indices ranging in 0-1, 1-2, ... 11-12 are rounded to 0, 1, ... 11. I refer to the reassessed regressand as INTEGER IPROFILE. Still, I use a cluster-robust covariance matrix to calculate the standard errors of the error term. The results are presented in Table 4.

With the set of control variables, the results do not change if we compare them to the findings of the nonlinear specifications with OLS (see Table 3). The demographic measure YWORKERS has a negative impact on the dependent variable. Except for the inclusion of LABOREDUC, however, the coefficients are insignificant and thus do not convey a clear picture if a high volume of old workers has a positive effect on the security of property rights. GROWTH(-1), again has a positive and mostly significant effect. The relevance of economic wellbeing is emphasized by the coefficients of INFLATION. Inflation, i.e. monetary and thus macroeconomic instability, spurs public discontent which may turn against successful foreign investors. Finally, institutional quality has large explanatory power for the perceived security of property rights. As with OLS, this can be seen from the results of POLREPRESS and GOVSTAB. If host countries grant their population rights to affect the policy outcome and if their governments are strong enough to carry out the popular will, they are perceived as safe investment targets.

No matter the choice of the proxy for HUMAN CAPITAL, INTEGER IPROFILE increases with the quality of the labor force but at a decreasing rate. Both with ordered logit and ordered probit, the coefficients of the linear effects are significantly positive. Moreover, the negative and mostly significant coefficients of the quadratic terms lead to the conjecture that the human capital effect on the perceived security of property rights vanishes, if the supply of high-skilled labor is too large. This emphasizes the *labor supply effect*, i.e. the role

of diminishing returns to high-skilled labor. Once the supply of high-skilled workers is too large, their productivity falls back the productivity of low-skilled workers. If this transfers into wage payments, high-skilled workers' positive attitudes toward inflowing investment vanish.

5 Conclusions

The goal of this paper was to investigate if and how a less developed country's high-skilled employment share affects the risk of expropriation faced by foreign investors. Focusing on FDI flows from developed regions that incur advanced skill-biased technologies, foreign investment raises the host economy's *total* factor productivity and the relative productivity of high-skilled labor. If this turns into high-skilled wage premia, FDI inflows give rise to distributional conflict between workers along educational lines. This spurs discontent among low-skilled employees, which potentially turns into political pressure to obstruct and even expropriate foreign investors.

In a one-period model the skill share of a small open LDC was shown to affect FDI flows from developed regions in a curvilinear way. It was assumed that host government policies reflect the support of the domestic labor force and that expropriation risk constrains FDI. High-skilled workers benefit from foreign capital *and* knowledge, which provides a productivity advantage over low-skilled labor. Since expropriation implies the withdrawal of foreign know-how and the disappearance of the skill-bias, the costs from expropriation in terms of output increase with the skill share. However, once the skill share is sufficiently large, low-skilled labor productivity exceeds the productiveness of high-skilled workers. Then, additional employment of high-skilled labor reduces foreign firms' output. The costs from the withdrawal of foreign expertise decline and FDI flows reduce. However, relating the constrained level of FDI to a benchmark level with secure property rights, the extent of expropriation risk decreases with each marginal increase of the skill share. This effect diminishes, at least if the bulk of workers is low-skilled.

The empirical investigation supports the results of the model. In a sample of non-developed countries, the perceived security of property rights is spurred by a larger domestic human capital stock. Moreover, in most of the estimations employed, the latter effect decreases with further human capital. The empirical findings thus support the notion that high-skilled workers benefit from FDI to a larger extent. This emphasizes the idea of FDI entailing skill-biased technological change. Furthermore, in cases where the effect is found to decline, the productivity advantage of high-skilled workers is counteracted by some other force, if the supply is *too* large. I conjecture that this force is diminishing skill returns. Nevertheless, whether it is the main driving force behind the nonlinear human capital effect on the security of property rights should be subject of further research.

References

Acemoglu, D. (2003). Patterns of Skill Premia. *Review of Economic Studies 70*(243), 199–230.

Acemoglu, D., S. Johnson, and J. A. Robinson (2001). The Colonial Origins of Comparative Development: An Empirical Investigation. *American Economic Review 91*(5), 1369–1401.

Acemoglu, D. and J. A. Robinson (2001). A Theory of Political Transitions. *American Economic Review 91*(4), 938–963.

Aghion, P. (2002). Schumpeterian growth theory and the dynamics of income inequality. *Econometrica 70*(3), 855–882.

Aghion, P. and P. Howitt (1998). *Endogenous Growth Theory*. Cambridge, MIT Press.

Aguiar, M. and M. Amador (2009). Growth in the Shadow of Expropriation. *NBER Working Paper* (15194).

Aguiar, M., M. Amador, and G. Gopinath (2009). Investment Cycles and Sovereign Debt Overhang. *Review of Economic Studies 76*(1), 1–31.

Aitken, B., A. Harrison, and R. E. Lipsey (1996). Wages and Foreign Ownership: A Comparative study of Mexico, Venezuela and the United States. *Journal of International Economics 40*(3–4), 345–371.

Autor, D. H., L. F. Katz, and A. B. Krueger (1998). Computing Inequality: Have Computers Changed the Labor Market. *Quarterly Journal of Economics 113*(4), 1169–1213.

Barro, R. J. and J.-W. Lee (2001). International data on educational attainment: Updates and implications. *Oxford Economic Papers 53*(3), 541–563. Data available on: `http://www.cid.harvard.edu/ciddata/ciddata.html`.

Berman, E., J. Bound, and Z. Griliches (1994). Changes in the Demand for Skilled Labor within U.S. Manufacturing: Evidence from the Annual Survey of Manufacturers. *Quarterly Journal of Economics 109*(2), 367–397.

Bernard, A. B., J. Eaton, J. B. Jensen, and S. Kortum (2003). Plants and Productivity in International Trade. *American Economic Review 93*(4), 1268–1290.

Bloom, N. and J. van Reenen (2007). Measuring and explaining management practices across firms and countries. *Quarterly Journal of Economics 122*(4), 1351–1408.

Bradley, D. G. (1977). Managing against expropriation. *Harvard Business Review 55*(4), 75–83.

Bruno, G. S. F., R. Crino, and A. M. Falzoni (2004). Foreign Direct Investment, Wage Inequality, and Skilled Labor Demand in EU Accession Countries. *Centro Studi Luca D'Agliano Development Studies Working Papers 188*.

Bulow, J. I. and K. Rogoff (1989). Sovereign Debt: Is to Forgive to Forget? *American Economic Review 79*(1), 43–50.

Burstein, A. T. and A. Monge-Naranjo (2009). Foreign know-how, firm control, and the income of developing countries. *Quarterly Journal of Economics 124*(1), 149–195.

Burton, F. and H. Inoue (1987). A country risk appraisal model of foreign asset expropriation in developing countries. *Applied Economics 19*(8), 1009–1048.

Bustos, P. (2005). The Impact of Trade on Technology and Skill Upgrading Evidence from Argentina. *Economics Working Papers* (1189).

Clark, E. (2003). Pricing the Cost of Expropriation Risk. *Review of International Economics 11*(2), 412–422.

Cole, H. L. and W. B. English (1991). Expropriation and Direct Investment. *Journal of International Economics 30*(3–4), 201–227.

Duncan, R. (2006). Price or politics? An investigation of the causes of expropriation. *Australian Journal of Agricultural and Resource Economics 50*(1), 85–101.

Easterly, W. and R. Levine (2003). Tropics, germs, and crops: How endowments influence economic development. *Journal of Monetary Economics 50*(1), 3–39.

Eaton, J. and M. Gersovitz (1984). A theory of expropriation and deviations from perfect capital mobility. *Economic Journal 94*(373), 16–40.

Feenstra, R. C. and G. H. Hanson (1997). Foreign direct investment and relative wages: Evidence from Mexico's maquiladoras. *Journal of International Economics 42*(3–4), 371–393.

Feenstra, R. C. and G. H. Hanson (2003). Global Production Sharing and rising Inequality: A survey of Trade and Wages. In K. Choi and J. Harrigan (Eds.), *Handbook of International Trade, Oxford*, pp. 146–185. Blackwell: Malden, MA.

Freedom House (2009). *Freedom in the World 2009: The Annual Survey of Political Rights and Civil Liberties*. Rowman & Littlefield Publishers, Inc.

Geiger, L. T. (1989). Expropriation and External Capital Flows. *Economic Development and Cultural Change 37*(3), 535–556.

Goldberg, P. K. and N. Pavcnik (2007). Distributional Effects of Globalization in Developing Countries. *Journal of Economic Literature 45*(1), 39–82.

Görg, H., E. Strobl, and F. Walsh (2007). Why Do Foreign-Owned Firms Pay More? The Role of On-the-Job Training. *Review of World Economics 143*(3), 464–482.

Hajzler, C. (2008). Resource-based FDI and Expropriation in Developing Economies. *Job Market Paper*.

Hall, R. E. and C. I. Jones (1999). Why do some countries produce so much more output per worker than others? *Quarterly Journal of Economics 114*(1), 83–116.

Hanson, G. H. and A. Harrison (1995). Trade, Technology, and Wage Inequality. *NBER Working Paper* (5110).

Harms, P. and P. an de Meulen (2011). The Demographics of Expropriation Risk. *Journal of Population Economics (forthcoming)*.

Henry, P. B. and D. Sasson (2009). Capital Market Integration and Wages. *NBER Working Paper* (15204).

Jensen, N. (2003). Democratic Governance and Multinational Corporations: Political Regimes and Inflows of Foreign Direct Investment. *International Organization 57*(3), 587–616.

Jensen, N. (2008). Political Risk, Democratic Institutions, and Foreign Direct Investment. *Journal of Politics 70*(4), 1040–1052.

Jodice, D. A. (1980). Sources of change in Third World regimes for foreign direct investment, 1968-1976. *International Organization 34*(2), 177–206.

Kobrin, S. J. (1980). Foreign enterprise and forced divestment in LDCs. *International Organization 34*(1), 65–88.

Kobrin, S. J. (1984). Expropriation as an Attempt to Control Foreign Firms in LDCs: Trends from 1960 to 1979. *International Studies Quarterly 28*(3), 329–348.

Krugman, P. R. (2000). Technology, trade and factor prices. *Journal of International Economics 50*(1), 51–71.

Li, Q. (2009). Democracy, Autocracy, and Expropriation of Foreign Direct Investment. *Comparative Political Studies 42*(8), 1098–1127.

Li, Q. and A. Resnick (2003). Reversal of Fortunes: Democratic Institutions and Foreign Direct Investment Inflows to Developing Countries. *International Organization 57*(1), 175–211.

Lipsey, R. E. and F. Sjöholm (2004). Foreign direct investment, education and wages in Indonesian manufacturing. *Journal of Development Economics 73*(1), 415–422.

Lipsey, R. E. and F. Sjöholm (2006). Foreign Firms and Indonesian Manufacturing Wages: An Analysis with Panel Data. *Economic Development and Cultural Change 55*(1), 201–221.

Martins, P. S. (2004). Do Foreign Firms really pay Higher Wages? Evidence from Different Estimators. *IZA Discussion Paper* (1388).

Melitz, M. J. (2003). The impact of trade on intra-industry reallocations and aggregate industry productivity. *Econometrica 71*(6), 1695–1725.

Minor, M. S. (1994). The demise of expropriation as an instrument of LDC policy, 1980-1992. *Journal of International Business Studies 25*(1), 177–188.

Morsy, H. (2009). Current Account Determinants for Oil-Exporting Countries. *IMF Working Paper* (09/28).

Pavcnik, N. (2003). What explains skill upgrading in less developed countries? *Journal of Development Economics 71*(2), 311–328.

Picht, H. and V. Stüven (1991). Expropriation of Foreign Direct Investment: Empirical Evidence and Implications for the Debt Crisis. *Public Choice 69*(1), 19–38.

Political Risk Services Group (2008). International Country Risk Guide. `http://www.prsgroup.com/prsgroup_shoppingcart/c-4-icrg.aspx`. New York: Political Risk Services.

PWT (2009). Penn World Table 6.2. Center for International Comparisons, University of Pennsylvania. `http://pwt.econ.upenn.edu/php_site/pwt62/pwt62_form.php`.

Raff, H. (1992). A model of expropriation with asymmetric information. *Journal of International Economics 33*(3-4), 245–265.

Rodrik, D., A. Subramanian, and F. Trebbi (2004). Institutions Rule: The Primacy of Institutions over Geography and Integration in Economic Development. *Journal of Economic Growth 9*(2), 131–165.

Stasavage, D. (2002). Private Investment and Political Institutions. *Economics and Politics 14*(1), 41–63.

te Velde, D. W. and O. Morrissey (2003). Do Workers in Africa get a Wage Premium if Employed in Firms Owned by Foreigners? *Journal of African Economies 12*(1), 41–73.

Thomas, J. and T. Worrall (1994). Foreign direct investment and the risk of expropriation. *Review of Economic Studies 61*(1), 81–108.

Tomz, M. and M. L. J. Wright (2008). Sovereign Theft: Theory and Evidence about Sovereign Default and Expropriation. In W. Hogan and F. Sturzenegger (Eds.), *The Natural Resources Trap: Private Investment without Public Commitment*. Cambridge, MA: MIT Press, forthcoming 2010.

United Nations Conference on Trade and Development (UNCTAD) (1994). World Investment Report 1994: Transnational Corporations, Employment and the Workplace. New York, Geneva: United Nations, 1994.

United Nations Population Division (2008). World Population Prospects: The 2008 Revision Population Database. http://esa.un.org/unpp.

Wells, L. T. (1998). God and Fair Competition: Does the Foreign Direct Investor Face Still Other Risks in Emerging Markets? In T. H. Moran (Ed.), *Managing International Political Risk*, pp. 15–31. Blackwell Publishers.

World Bank (1995). World Development Report 1995: Workers in an Integrating World. New York: Oxford University Press, 1995.

World Bank (2008). World Development Indicators Database 2008. World Bank GNI per capita Operational Guidelines & Analytical Classifications. http://web.worldbank.org/external/default/main?contentMDK=20487070&menuPK=64133156&pagePK=64133150&piPK=64133175&print=Y&theSitePK=239419. Washington DC, The World Bank.

World Bank (2009). World Development Indicators Database 2009. Data via Reuters Ecowin. Washington DC, The World Bank.

Yeaple, S. R. (2005). A simple model of firm heterogeneity, international trade, and wages. *Journal of International Economics 65*(1), 1–20.

A Summary Statistics

Variable	Mean	Overall Std. Dev.	Min.	Max.	Between-country Std. Dev.	No. of Observations
IPROFILE	5.968582	1.850832	1.333334	11.80834	1.211262	329
SCHOOLING	3.683806	2.078661	0.37	10.52	2.34946	289
LABOREDUC	81.42974	21.88937	5.8	100.025	22.88584	84
ENROLL(-1)	87.44383	25.47739	14.73773	152.4299	23.17211	383
YWORKERS	2.45223	0.4861485	1.055366	3.502297	0.5344292	402
GROWTH(-1)	0.8020731	4.608881	-30.602	24.94644	3.151468	377
INCOME(-1)	7.692672	0.7769963	5.560337	9.425548	0.8072534	383
LAWORDER	2.940377	1.179587	0.5666666	6	1.045253	329
INFLATION	2.365316	1.337023	-0.8442437	7.993372	0.9925757	366
POLREPRESS	4.468333	1.787764	1	7	1.631782	400
GOVSTAB	6.924151	2.220031	1	11.41667	1.333423	329
OPENNESS(-1)	0.636351	0.3225166	0.1145425	1.938305	0.3445567	393
OIL	.1393035	0.3466944	0	1	0.3544608	402
LATITUDE	561.5314	728.1178	0.051984	3443.929	845.3361	384
RAWMAT	0.380597	0.4861387	0	1	0.4759593	402

Table 1: Summary Statistics

B Tables

	Benchmark Specification					
	OLS			Fixed Effects		
	DE-MEAN SCHOOLING	LABOREDUC	ENROLL(-1)	DE-MEAN SCHOOLING	LABOREDUC	ENROLL(-1)
DEMEAN SCHOOLING	0.210***			0.268		
	[0.061]			[0.301]		
LABOREDUC		0.017*			0.012	
		[0.009]			[0.034]	
ENROLL(-1)			0.013***			0.004
			[0.004]			[0.008]
YWORKERS	−0.187	−0.900	−0.197	−0.898*	−2.295	−0.548
	[0.340]	[0.602]	[0.325]	[0.519]	[1.857]	[0.633]
GROWTH(-1)	0.085***	0.113***	0.041*	0.066**	0.151***	0.041*
	[0.029]	[0.039]	[0.021]	[0.031]	[0.041]	[0.021]
INCOME(-1)	−0.045	0.025	0.150	−0.806	−6.247***	−0.435
	[0.240]	[0.394]	[0.235]	[0.560]	[2.128]	[0.564]
LAWORDER	−0.009	−0.004	0.074	0.086	−0.078	0.164
	[0.100]	[0.216]	[0.089]	[0.159]	[0.372]	[0.137]
INFLATION	−0.327***	0.015	−0.363***	−0.390***	0.228	−0.388***
	[0.110]	[0.184]	[0.097]	[0.139]	[0.403]	[0.118]
POLREPRESS	−0.252***	−0.257*	−0.224***	−0.186**	−0.350**	−0.186**
	[0.068]	[0.148]	[0.060]	[0.082]	[0.173]	[0.081]
GOVSTAB	0.490***	0.577***	0.463***	0.452***	0.409**	0.464***
	[0.063]	[0.155]	[0.067]	[0.087]	[0.175]	[0.086]
OPENNESS(-1)	−0.245	0.069	−0.101	−0.258	−0.912	−0.389
	[0.266]	[0.559]	[0.258]	[0.736]	[1.780]	[0.719]
OIL	−0.421	−1.122*	−0.327			
	[0.259]	[0.623]	[0.254]			
LATITUDE	−0.000	−0.001	−0.000			
	[0.000]	[0.001]	[0.000]			
RAWMAT	0.479**	0.061	0.364*			
	[0.221]	[0.465]	[0.203]			
Constant	4.712*	4.134	2.302	12.973***	62.135***	8.317*
	[2.465]	[3.584]	[2.493]	[4.403]	[18.716]	[4.838]
Adj. R-squared	0.628	0.608	0.596	0.658	0.907	0.637
Observations	239	73	284	239	73	284

Note: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variable is IPROFILE. The data sample is an unbalanced panel, comprising five-year averages and a two-year average or initial values between 1984-2005. All regressions include regional and time dummies; their coefficients are available upon request. The estimates are based on robust standard errors clustered by country.

Table 2: Benchmark Specification: The effect of HUMAN CAPITAL on IPROFILE using pooled OLS and fixed effects estimation

Nonlinear Effects						
	OLS			Fixed Effects		
	DE-MEAN SCHOOLING	LABOREDUC	ENROLL(-1)	DE-MEAN SCHOOLING	LABOREDUC	ENROLL(-1)
DEMEAN SCHOOLING	0.254***			0.244		
	[0.059]			[0.286]		
DEMEAN SCHOOLING SQUARED	−0.052***			0.021		
	[0.016]			[0.067]		
MARGINAL EFFECT OF DEMEAN SCHOOLING	0.241***			0.249		
	[0.058]			[0.286]		
LABOREDUC		0.053*			0.226***	
		[0.031]			[0.067]	
LABOREDUC SQUARED		−0.000			−0.001***	
		[0.000]			[0.000]	
MARGINAL EFFECT OF LABOREDUC		0.004			−0.006	
		[0.016]			[0.034]	
ENROLL(-1)			0.028**			0.062
			[0.012]			[0.045]
ENROLL(-1) SQUARED			−0.000			−0.000
			[0.000]			[0.000]
MARGINAL EFFECT OF ENROLL(-1)			0.011***			0.006
			[0.004]			[0.008]
YWORKERS	−0.323	−1.064*	−0.204	−0.897*	−3.874**	−0.880
	[0.342]	[0.625]	[0.329]	[0.517]	[1.636]	[0.589]
GROWTH(-1)	0.077***	0.110***	0.041**	0.065**	0.167***	0.042**
	[0.027]	[0.040]	[0.021]	[0.030]	[0.035]	[0.021]
INCOME(-1)	−0.123	0.044	0.152	−0.794	−6.782***	−0.524
	[0.239]	[0.402]	[0.236]	[0.560]	[1.819]	[0.531]
LAWORDER	−0.008	0.030	0.085	0.091	−0.335	0.173
	[0.101]	[0.217]	[0.090]	[0.163]	[0.365]	[0.131]
INFLATION	−0.360***	−0.029	−0.378***	−0.389***	−0.021	−0.408***
	[0.104]	[0.195]	[0.097]	[0.139]	[0.361]	[0.113]
POLREPRESS	−0.276***	−0.266*	−0.223***	−0.180**	−0.078	−0.170**
	[0.067]	[0.150]	[0.060]	[0.087]	[0.146]	[0.083]
GOVSTAB	0.457***	0.536***	0.456***	0.456***	0.123	0.463***
	[0.065]	[0.166]	[0.068]	[0.090]	[0.174]	[0.087]
OPENNESS(-1)	−0.196	0.056	−0.166	−0.242	1.050	−0.370
	[0.240]	[0.582]	[0.265]	[0.735]	[1.428]	[0.703]
OIL	−0.391	−1.014	−0.315			
	[0.254]	[0.628]	[0.251]			
LATITUDE	0.000	−0.001	−0.000			
	[0.000]	[0.001]	[0.000]			
RAWMAT	0.491**	0.166	0.357*			
	[0.212]	[0.480]	[0.209]			
Constant	6.257**	3.851	1.842	12.534***	63.533***	7.284
	[2.511]	[3.617]	[2.509]	[4.517]	[15.594]	[5.033]
Adj. R-squared	0.638	0.607	0.595	0.656	0.926	0.641
Observations	239	73	284	239	73	284

Note: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variable is IPROFILE. The data sample is an unbalanced panel, comprising five-year averages and a two-year average or initial values between 1984-2005. All regressions include regional and time dummies; their coefficients are available upon request. The estimates are based on robust standard errors clustered by country.

Table 3: Nonlinear Effects: Inclusion of SQUARED HUMAN CAPITAL – pooled OLS and fixed effects estimation

Nonlinear Effects – Ordered Probit and Ordered Logit

	Ordered Probit			Ordered Logit		
	DE-MEAN SCHOOLING	LABOREDUC	ENROLL(-1)	DE-MEAN SCHOOLING	LABOREDUC	ENROLL(-1)
DEMEAN SCHOOLING	0.239***			0.443***		
	[0.059]			[0.118]		
DEMEAN SCHOOLING SQUARED	−0.058***			−0.108***		
	[0.018]			[0.036]		
LABOREDUC		0.081***			0.118**	
		[0.028]			[0.055]	
LABOREDUC SQUARED		−0.001**			−0.001	
		[0.000]			[0.000]	
ENROLL(-1)			0.040***			0.067***
			[0.011]			[0.018]
ENROLL(-1) SQUARED			−0.000**			−0.000**
			[0.000]			[0.000]
YWORKERS	−0.200	−1.350**	−0.125	−0.340	−2.072*	−0.184
	[0.328]	[0.546]	[0.288]	[0.577]	[1.127]	[0.541]
GROWTH(-1)	0.079***	0.083**	0.036*	0.145***	0.149	0.061
	[0.026]	[0.039]	[0.018]	[0.047]	[0.108]	[0.039]
INCOME(-1)	−0.146	−0.084	0.099	−0.194	−0.127	0.176
	[0.237]	[0.366]	[0.213]	[0.413]	[0.752]	[0.396]
LAWORDER	−0.008	0.090	0.087	−0.065	0.084	0.141
	[0.095]	[0.188]	[0.080]	[0.189]	[0.410]	[0.154]
INFLATION	−0.359***	−0.005	−0.375***	−0.557***	0.129	−0.604***
	[0.091]	[0.176]	[0.085]	[0.161]	[0.350]	[0.152]
POLREPRESS	−0.286***	−0.343**	−0.223***	−0.519***	−0.520*	−0.398***
	[0.068]	[0.135]	[0.055]	[0.127]	[0.272]	[0.103]
GOVSTAB	0.457***	0.521***	0.446***	0.832***	1.006**	0.807***
	[0.074]	[0.165]	[0.072]	[0.137]	[0.415]	[0.131]
OPENNESS(-1)	−0.300	−0.112	−0.342	−0.306	−0.074	−0.470
	[0.259]	[0.491]	[0.251]	[0.470]	[1.039]	[0.467]
OIL	−0.339	−0.668	−0.250	−0.692	−1.653	−0.498
	[0.273]	[0.558]	[0.244]	[0.536]	[1.294]	[0.489]
LATITUDE	0.000	−0.001	−0.000	0.000	−0.001	−0.000
	[0.000]	[0.000]	[0.000]	[0.001]	[0.001]	[0.001]
RAWMAT	0.425**	0.356	0.303	0.737*	0.453	0.465
Pseudo R-squared	0.270	0.295	0.242	0.275	0.291	0.242
Observations	239	73	284	239	73	284

Note: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variable is INTEGER IPROFILE. The data sample is an unbalanced panel, comprising five-year averages and a two-year average or initial values between 1984-2005. All regressions include regional and time dummies; their coefficients are available upon request. The estimates are based on robust standard errors clustered by country.

Table 4: Nonlinear Effects: Inclusion of SQUARED HUMAN CAPITAL – Ordered Logit and Ordered Probit estimation

C Variable Description

Variable Description

Variable	Description & Source
ENROLL(-1)	Five-year average of the gross primary enrollment, measuring the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of primary education. *Source:* World Bank (2009)
GOVSTAB	Five-year average of the International Country Risk Guide "Government Stability" rating, which reflects the government's ability to carry out its declared program(s) and its ability to stay in office. "Government Stability" is the sum of three subcomponents (Government Unity, Legislative Strength and Popular Support), each with a maximum score of four points (very low risk) and a minimum score of 0 points (very high risk). *Source:* Political Risk Services Group (2008)
GROWTH(-1)	Five-year average of the annual growth rates of real-per capita GDP of the preceding five-year period in constant PPP-adjusted international Dollars (Base year: 2000). *Source:* PWT (2009)
IPROFILE	Five-year average of the rating of the government's attitude to inward investment as the sum of three sub-components, each with a maximum score of four points (very low risk) and a minimum score of 0 points (very high risk). The subcomponents are risk of expropriation or contract viability, payment delays and barriers on the repatriation of profits. *Source:* Political Risk Services Group (2008)
INCOME(-1)	Five-year average of the log of real-per capita GDP of the preceding five-year period in constant PPP-adjusted international Dollars (Base year: 2000). *Source:* PWT (2009)

Table 5: Variable Description

Variable Description

Variable	Description & Source
INFLATION	Five-year average of the percentaged inflation rate measured by the consumer price index. *Source:* World Bank (2009)
LABOREDUC	Five-year average of the percentaged labor force share, that has primary, secondary or tertiary education. *Source:* World Bank (2009)
LATITUDE	A country's squared latitude measuring the geographical distance from the equator. *Source:* World Bank (2009)
LAWORDER	Five-year average of the rating of Law and Order, assessed separately. The Law sub-component is an assessment of the strength and impartiality of the legal system, while the Order sub-component is an assessment of popular observance of the law. Both sub-component comprise zero (low quality) to three points (high quality). *Source:* Political Risk Services Group (2008)
OIL	Subsumes 28 oil-exporting economies, referring to the period of 1970 - 2006, using the World Economic Outlook (WEO) and World Development Indicators (WDI) as well as Data on oil production and reserves obtained from BP Statistical Review of World Energy June 2007 as data sources. The chosen countries are Algeria, Angola, Azerbaijan, Bahrain, Colombia, Republic of Congo, Ecuador, Equatorial Guinea, Gabon, Indonesia, Iran, Kazakhstan, Kuwait, Libya, Mexico, Nigeria, Norway, Oman, Qatar, Russia, Saudi Arabia, Sudan, Syria, Trinidad and Tobago, Turkmenistan, United Arab Emirates, Venezuela, and Yemen. *Source:* Morsy (2009)

Table 6: Variable Description (contd.)

Variable Description

Variable	Description & Source
OPENNESS(-1)	Five-year average of the sum of exports and imports of goods and services as a share of GDP. Exports or imports of goods and services represent the value of all goods and other market services provided to or received from the world. Included is the value of merchandise, freight, insurance, travel, and other nonfactor services. Factor and property income (formerly called factor services), such as investment income, interest, and labor income, is excluded. *Source:* World Bank (2009)
POLREPRESS	Five-year average of The Freedom House Political Rights index, measuring the degree of freedom in the electoral process, political pluralism and participation, and functioning of government. Freedom House rates political rights on a scale of 1 (most free) to 7 (least free). *Source:* Freedom House (2009)
RAWMAT	Subsumes major exporters of non-fuel primary products if more than 50% or more of total exports of goods and services are non-fuel raw materials between 1988 and 1992. *Source:* World Bank (1995, pp. 250-254)
SCHOOLING	Initial value of the average years of school attendance of the total population aged over 25 years. *Source:* Barro and Lee (2001)
YWORKERS	Initial value of the ratio of the population number aged 15-39 years to the population number aged 40-64 years. *Source:* United Nations Population Division (2008)

Table 7: Variable Description (contd.)

D Countries

Countries
Albania, Algeria, Armenia, Azerbaijan, Bangladesh, Bolivia, Botswana, Brazil, Bulgaria, Burkina Faso, Cameroon, Chile, Colombia, Costa Rica, Ivory Coast, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Ethiopia, Gambia, Georgia, Ghana, Guatemala, Guinea-Bissau, Haiti, Honduras, Hungary, India, Indonesia, Islamic Republic of Iran, Jamaica, Jordan, Kazakhstan, Kenya, Latvia, Liberia, Lithuania, Madagascar, Malawi, Malaysia, Mali, Mexico, Moldova, Morocco, Mozambique, Nicaragua, Niger, Nigeria, Pakistan, Panama, Papua New Guinea, Paraguay, People's Republic of China, Peru, Philippines, Poland, Republic of Congo, Romania, Russia, Senegal, Sierra Leone, South Africa, Sri Lanka, Sudan, Syrian Arab Republic, Tanzania, Thailand, Togo, Tunisia, Turkey, Uganda, Ukraine, Uruguay, Venezuela, Vietnam, Zambia, Zimbabwe

Table 8: List of Countries included in the sample of LDCs