Gall, Thomas; Schiffbauer, Marc; Kubny, Julia

Conference Paper

Dynamic Effects of Foreign Direct Investment When Credit Markets are Imperfect

Proceedings of the German Development Economics Conference, Hannover 2010, No. 5

Provided in cooperation with:
Verein für Socialpolitik

Dynamic Effects of Foreign Direct Investment When Credit Markets are Imperfect*

Thomas Gall†, Marc Schiffbauer‡, and Julia Kubny§

This Version: February 9, 2010

Abstract

This paper argues that foreign direct investment in economies with credit market imperfections may increase their vulnerability to capital flow shocks. Due to better access to financial markets foreign firms can use other wage contracts than domestic ones. This alters the domestic wage composition and the subsequent wealth distribution. When credit markets are imperfect, the wealth distribution typically determines an economy's growth potential in autarky; hence, high exposure to foreign direct investment may significantly impede the capability to recover from sudden withdrawals of foreign capital. This is substantiated by empirical evidence on durations of output recovery after systemic sudden stops.

Keywords: Credit market imperfections, foreign direct investment, growth, occupational choice, sudden stops.

JEL: F43, F23, O16

1 Introduction

In economies where capital is scarce and credit market imperfections are severe, foreign direct investment can provide an adequate means to channel capital to its most productive use. Independent of further effects such as technology spill-overs or disciplinary effects of fiercer competition, foreign

*We are grateful for valuable comments and discussion to Michael Brei, Michael Evers, John Harris, Andy Newman, and to seminar participants at Bonn and BU, and the EEA and NEUDC meetings 2008. Philipp Külpmann provided able research assistance. All remaining errors are, of course, our own.

†Corresponding author. Economic Theory II, University of Bonn, Lennéstr. 37, 53113 Bonn, Germany; email: tgall@uni-bonn.de

‡World Bank; email: mschiffbauer@worldbank.org.

§German Development Institute, Bonn, and Centre for International Business, University of Leeds, UK; email: julia.kubny@die-gdi.de.

capital inflows may enable the undertaking of profitable projects that otherwise would not have been implemented, and thus boost domestic growth. This may, however, come at the cost of increased vulnerability to sudden capital outflows, the relevance of which is underlined by the ongoing global financial crisis.

Better access to international and corporate financial markets by a foreign owner extends the set of feasible wage contracts in foreign owned firms. Hence, their wage profiles can be expected to differ systematically from those of domestic firms. Indeed empirical evidence (reviewed in the following section) indicates that higher exposure to foreign direct investment tends to be related to higher wage inequality across firms, which is only partly explained by a skill premium that foreign owned firms offer for higher education. This matters, as in the presence of credit market frictions the distribution of wealth and income has a role in determining the dynamics of economic growth (as pointed out by Banerjee and Newman, 1993, Galor and Zeira, 1993, and a subsequent literature). We demonstrate that the equilibrium wage distribution under foreign direct investment may inhibit the formation of next period's stock of potential domestic entrepreneurs, rendering the host economy vulnerable to capital flow shocks such as sudden stops.

This is the case when imperfect domestic financial markets limit the ability of domestic firms to diversify risk, which implies higher default risk for domestic than for foreign owned firms. This in turn reduces the set of feasible wage contracts under limited liability and forces domestic entrepreneurs to offer unnecessarily high powered incentives to their employees. Foreign owned firms on the contrary have access to international and corporate capital markets, and are able to align incentives provided by wages to the underlying problems of moral hazard. For many tasks, in particular simple ones where output is easily observable, these do not require high powered incentives. This may generate higher variance of wages between successful and unsuccessful domestic firms than is the case for foreign firms, albeit foreign ownership confers a wage premium on average. Supporting evidence based on firm level data is presented in the following section.

Sufficiently high success wages in domestic firms enable recipients' offspring to become entrepreneurs despite the credit market frictions. Hence, riskier wage profiles in domestic firms imply social mobility and ensure a sustainable stock of future potential domestic entrepreneurs. This implicitly provides a de facto insurance against systemic shocks that lead to sudden withdrawal of foreign capital from the domestic economy, as domestic en-

trepreneurs are needed to overcome the credit rationing caused by credit market frictions. Wage profiles in foreign firms have lower success wages and thus may fail to enable workers' offspring to be potential entrepreneurs in the next period, even when wages paid by foreign owners are higher on average. Ironically, the diversification of idiosyncratic risk in foreign firms increases the vulnerability to systemic shocks of the host economy.

Following this line of reasoning, higher past exposure to foreign direct investment impedes an economy's ability to respond to sudden withdrawals, or sudden stops, when domestic credit market frictions are sufficiently severe. This provides a testable prediction that is consistent with a first glance at the evidence. We use a sample of 33 systemic sudden stops (as classified by Calvo et al., 2006) in 23 countries between 1980 and 2000. These were typically triggered by currency crises and contagion, and are thus unlikely to depend on past exposure to foreign direct investment. We find that past inflow of foreign direct investment delays the duration of a full output recovery after a systemic sudden stop in economies characterized by weak creditor protection (from Djankov et al., 2007).

We use a dynamic occupational choice model à la Banerjee and Newman (1993), where domestic and foreign owners access different capital markets, and creditor rights are less well protected in domestic capital markets than in foreign ones. Firms' production is stochastic, so that debt-financed domestic firms default with positive probability and pay high success wages. Setting up a firm requires an indivisible investment, and poor creditor rights protection makes collateral necessary to obtain a loan. This leads to the afore mentioned pecuniary intergenerational externality: success wages in domestic firms are high enough to provide employees' offspring with enough endowment to become entrepreneurs. Foreign firms are not borrowing constrained, diversify and offer wage contracts with a lower success wage. This may not suffice to create next period's potential domestic entrepreneurs, and thus impede social mobility. Better access to loans of foreign owners and free entry implies that the domestic economy overcomes the credit rationing caused by domestic credit market frictions, and instantly reaches the steady state allocation to which it would have converged only in the long-run in the absence of foreign direct investment. Lack of potential domestic entrepreneurs matters, however, when foreign direct investment is withdrawn: higher past exposure to foreign direct investment yields a lower stock of domestic entrepreneurs, which in turn reduces the growth rate after withdrawal and prolongs the time to output recovery.

In our model foreign direct investment has an unambiguously beneficial direct effect on the host economy by providing access to more efficient capital markets, while the change in the composition of wages leads to an adverse effect only in case of sudden capital withdrawal. To keep our analysis tractable and focus on the composition effect, we abstract from other channels such as technological or human capital spill-overs from foreign to domestic firms, or fiercer competition in domestic markets (see e.g. Fosfuri et al., 2001, Markusen and Venables, 1999, among others). These benefits should matter particularly for economies that suffer from scarcity of capital and severe capital market imperfections, i.e. relatively backward economies (Findlay, 1978). Empirical findings on effects of foreign direct investment on growth remain ambiguous; effects seem to be highly dependent on host country characteristics (see the survey by De Mello, 1997). Mayer-Foulkes and Nunnenkamp (2005) find that U.S. foreign direct investment contributes to convergence in income only for countries with a relatively high per capita income ex ante, whereas effects on middle and low income economies are adverse. The same holds for studies of specific channels such as productivity spill-overs (see the survey by Görg and Greenaway, 2004). Aitken and Harrison (1999) analyze panel data from Venezuela and find a small net impact on plant productivity, which appears to be seized entirely by joint ventures involving multinationals. Similarly, Javorcik (2004) reports that productivity spill-overs only occur through joint ownership or vertical linkages between foreign-owned suppliers and domestic firms in upstream sectors in Lithuania. Borensztein et al. (1998) find that foreign direct investment seems to be particularly effective when the host country is endowed with sufficient human capital; Alfaro et al. (2004) and Hermes and Lensink (2003) find this to be the case when local financial markets are sufficiently developed.

This paper is related to the literature on inequality and growth, particularly to studies that analyze effects of changes in credit market frictions on the dynamics of the wealth distribution and long run growth. Ahlin and Jiang (2008) and Ghatak et al. (2001) use versions of the Banerjee and Newman (1993) model and find that better credit markets (through introduction of micro credit institutions or better law enforcement) may be accompanied by lower long-run growth. This is due to a distortion in occupational choice, since micro credit is available for certain occupations only, or to lower incentives to save when rents diminish. Gall (2008b) shows that when credit market imperfections are severe enough, minor improvements of formal credit markets may crowd out alternative, more efficient ways of

allocating capital such as ROSCAs, and generate an individual poverty trap.

Other related theoretical literature includes Grossman (1984), where foreign direct investment serves as an insurance device and efficiently crowds out domestic entrepreneurs in a static setting with risk averse agents. Young (1991) argues that opening the domestic market to foreign trade may induce poor economies to specialize in less profitable and less advanced sectors to their detriment. Matsuyama (2004) considers a model that allows for inequality of economies despite capital market integration. His argument relies on the absence of foreign direct investment, however. Balcão Reis (2001) puts forward the argument that foreign direct investment might reduce domestic welfare as profits are expatriated.

The paper proceeds by presenting evidence on the variation of wages across domestic and foreign firms in Section 2. Section 3 introduces the model framework. We then develop the baseline model of the domestic economy in autarky in Section 4 and allow for foreign direct investment in Section 5. Section 6 analyzes the effects of sudden withdrawal of foreign capital and provides some supporting evidence, and Section 7 concludes. The more cumbersome proofs and statistical tables are in the Appendix.

2 Empirical Pointers

Our argument works through the effect of foreign direct investment on an economy's growth dynamics via the income distribution. Therefore a closer look at the empirical relationship between foreign direct investment and the host country's wage distribution is in order.

Empirical work tends to find that inequality rises as foreign direct investments grow. Tsai (1995) and Choi (2006) examine effects of foreign direct investment on income inequality and find evidence for a positive relationship; effects seem to vary in less developed countries, however. Other studies focus on the effects on wage inequality in developed and developing countries and tend to conclude that foreign direct investments correlate with an increase in the premium for higher education, potentially amplifying wage inequality (see Aitken et al., 1996, Feenstra and Hanson, 1997). Lipsey and Sjöholm (2004) report that wages in foreign owned firms in Malaysia are generally higher and that this wage premium increases in workers' educational attainment. This may also affect investments: in a cross country study Basu and Guariglia (2007) document a positive correlation between foreign direct investment and both human capital inequality and growth rates.

Hence, wages paid by foreign owners seem to be higher on average, and more so for higher educated workers, which may increase wage inequality. This is primarily a statement on the wage variance across *employees*. However, the variation of wages across *firms* might follow a different pattern. In particular, when insolvency is relevant due to poor financing of entrepreneurs, wages in foreign owned firms may exhibit less variation across firms than wages in domestic firms. Consistent with our assumption of lower risk diversification in domestic firms, empirical findings suggest that default occurs more often in domestic firms than in foreign owned firms, see e.g. Li and Guisinger (1991) for the US and Mata and Portugal (2004) for Portugal.

The issue of wage variation across firms depending on whether ownership is domestic or foreign has received scant attention in the literature. Hence, we take a glance at the data, using the World Bank Enterprise Survey for 27 Eastern European and Central Asian countries in 2004. This database covers balance sheet information, firm characteristics, and managers' assessments on major obstacles to growth that are comparable across countries. Overall, the sample contains information for over 6000 firms. At a first glance coefficients of variation indicate that wage variation is higher across domestic firms in 21 out of 24 countries.[1] Moreover, the maximum firm-level wage rate in absolute terms was paid in all countries by a domestic firm.[2]

Figure 1 plots the fitted densities of the wages in domestic and foreign firms resulting from an OLS estimation (dashed line) of (the log of) a firm's average wage on a dummy variable (`for-OECD`), set to 1 if a firm is owned by a foreign firm from an OECD country and 0 otherwise. The estimation includes country and industry fixed effects, and a vector of the following firm-level control variables: a firm's share of part-time employees, share of employees with a higher education, share of skilled employees, size, hiring restrictions, and a dummy for whether or not a firm is an exporter. Comparing wage distributions in Figure 1, the one among domestic firms has more mass in both tails than the one among foreign owned firms. This is corroborated by a quantile regression (see Figure 6 in the Appendix) showing evidence for an inverted u-shaped relation between foreign ownership

[1] Exceptions are Bulgaria, Macedonia and Moldova. As a convention we treat a firm as foreign owned if at least 10 percent are owned by a company from an OECD country. Our results are robust to alternative definitions, e.g. whether the headquarter of a firm is located in a foreign country. Moreover, the available data underestimate the true wage variance among domestic firms as wage payments of defaulting firms are not observed.

[2] Note that these rankings do not change if we exclude domestic multinationals, i.e. domestic firms which also operate in foreign countries.

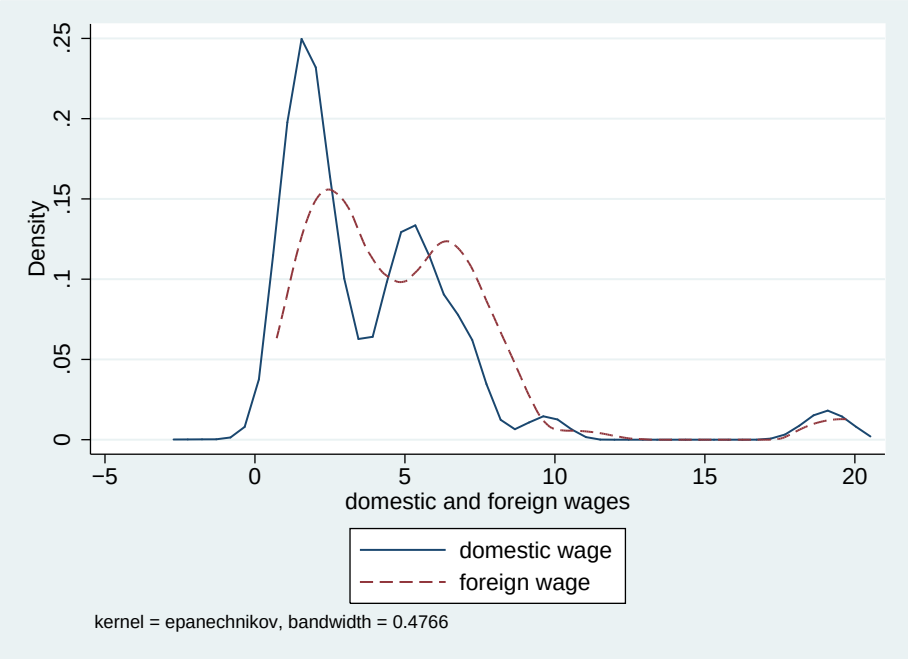

Figure 1: Density of fitted wage in domestic and foreign owned firms

premium and the firm's quantile in the distribution of paid wages.

While there is little ambiguity at the bottom end of the distribution of paid wages, the picture is less clear at the top. Therefore we examine in greater detail the relationship between wages and foreign ownership among high-wage firms, specifically firms that pay the 10% or 5% highest (i.e. success) wages in the sample. In particular, we test the hypothesis that *high-wage firms pay relatively lower wages if they are foreign owned* (note that we suppose that the opposite is true for all other moderate-wage firms). Therefore, we regress the log of a firm's average wage on (i) a high-wage dummy variable[3] `hi90/95` (set to 1 if a firm's average wage is above the 90% (95%) wage quantile and 0 otherwise), and (ii) two interaction terms between the foreign ownership dummy and the mutually exclusive high- (`foroecd-hi90/95`) and moderate-wage dummies (`foroecd-lo90/95`), respectively. Moreover, we include country and industry fixed effects and the same control variables as before. In the last two specifications of both tables, we additionally control for financial indicators that describe a firm's access to finance.[4] Note that we consider two different definitions of foreign owner-

[3]Tables 1 (2) show that high-wage firms pay, on average, 4 (4.5) times higher wages.

[4]The financial indicators comprise a dummy if a firm is listed on a stock market, the amount of collateral a firm has to put up for an average loan relative to the loan value,

ship: more than 10 percent owned by a foreign firm from an OECD country, and headquarter is in a foreign country. The latter definition corresponds to two additional interaction terms labeled `forhq-hi` and `forhq-lo`, respectively. In both Tables 1 and 2, we find that foreign ownership commands a wage premium for moderate wage levels (`foroecd-lo` and `forhq-lo`). This wage premium declines when controlling for additional firm specific characteristics, and vanishes when controlling for the firms' financial frictions.[5] This means that better access to international and corporate capital markets by foreign owners helps to explain to the foreign ownership premium.

Moreover, the foreign ownership premium for high wage firms (the top quantile) has a negative sign throughout, rendering it a discount. However, the corresponding coefficients are significant throughout only when foreign ownership is defined by the location of a firm's headquarter. We regard this as the natural definition of foreign ownership as the primary concern is whether firms have access to foreign credit markets. For example, domestic firms pay 1.4 (1.8) times higher wages than foreign owned firms in the top 10% (5%) wage quantile after controlling for the effects of additional non-financial firm characteristics. This substantiates our hypothesis that successful (i.e. high wage) domestic firms pay better; thus the wage distribution among domestic firms has more mass in both tails than the one among foreign owned firms. Of course, we cannot rule out that foreign owners select into similar firms that pay above average wages, although our controls include industry fixed effects, share of employees with high skill/education, size, hiring restrictions, whether a firm exports or not, and ease of access to financial markets. Any selection story has to account for foreigners' cherry picking of high productivity firms (Javorcik, 2004). High productivity is likely to be related to adequate provision of incentives, for instance through bonuses. This would lead us to expect high success wages, and thus higher wages in successful firms, among the foreign firms, however.

In sum, in the labor markets in our sample (i) foreign owned firms pay on average higher market wages, (ii) the market wage premium due to foreign ownership vanishes after controlling for firms' access to finance and (iii) foreign owned firms pay lower wages than domestic firms in the top end of the wage distribution, which is consistent with higher success wages in domestic firms.

and the average interest rate a firm has to pay for an average loan.

[5]This is consistent with the observation that firms with access to loan markets with higher creditor rights protection choose safer investment projects by Acharya et al. (2009).

3 A Simple Framework

In the following we present a simple model of growth in the presence of credit market imperfections, where domestic and foreign firms set the same expected wage and the wage variance is higher across domestic firms.[6]

3.1 Agents

In each period t the domestic economy is populated by a continuum of agents endowed with unit measure. An agent i is born with initial wealth ω_i. Denote the density function of the domestic wealth distribution in period t by $G_t(\omega)$. Agents obtain utility from consumption c_t of the single good at the end of their lives, from bequests to their offspring b_t, and from exerting effort e_t in production according to the utility function

$$u = c_t^{1-\beta} b_t^{\beta} - \beta^{\beta}(1-\beta)^{1-\beta} k(e_t),$$

where $\beta \in (0,1)$ is a preference parameter determining the bequest share. That is, agents are risk-neutral in income y_t as $u = \gamma y_t - \gamma k(e_t)$ with $\gamma = \beta^{\beta}(1-\beta)^{1-\beta}$. Bequests and thus endowments of an agent's offspring are given by $\omega_{t+1} = b_t = \beta y_t$.

3.2 Production

The single good is produced in firms or in subsistence. A firm consists of two members, a manager and a worker, and requires a fixed setup cost of I units of the good.[7] Production is stochastic yielding output Y if the firm succeeds and 0 if it fails. Successes or failures are independent events across firms. Manager and worker differ in the extent to which their effort determines the firm's success probability. Assume for simplicity that the success probability is the manager's effort $e \in \{0; q\}$, with $0 < q < 1$. Effort choice of the manager is not contractible. Choosing effort q the manager incurs a cost of $k(q) = k$, and $k(0) = 0$ otherwise.[8]

[6] The results are consistent with a foreign ownership premium in expectations; equal expected wages facilitate the exposition, especially the comparative statics of the model.

[7] Our qualitative results extend to ratios of workers to managers greater than unity. Letting factor inputs vary in firms, e.g. by endogenizing firm size, considerably increases complexity of equilibrating the labor market and adds distortions in production technology choices (see e.g. Gall, 2008a), blurring the focus of this paper.

[8] The model is consistent with effort choice of workers, for example if a worker's task produces easily measurable output. This is best thought of as the entrepreneur's choice determining quality and the worker's choice determining quantity.

If not in firms agents produce in subsistence, which yields an income of $s > 0$ units of the good and does not require effort. Assume that $qY - rI - k > 2s$, that is production in firms using effort q is efficient.

3.3 Timing

The timing of events in the economy is as follows. At the beginning of a period t labor and capital markets open and agents choose capital investments and occupations. The labor market is competitive and cleared by an expected wage $\bar{v}_t^*$ that equates labor demand and supply. Then production takes place and projects' successes or failures realize. At the end of a period agents are paid out, decide on bequests and consume.

3.4 Credit Market

Agents can borrow or lend at the world market interest rate r in a credit market.[9] That is, the domestic economy has access to foreign credit markets, subject to domestic imperfections. The domestic credit market is subject to frictions in the form of moral hazard on the side of the borrowers. If a project succeeds, a borrower may wrongfully announce that the firm failed and attempt to abscond with the revenue. With probability δ she is caught by her creditors and loses the firm's revenue. δ is best interpreted as the quality of creditor rights protection in an economy.

3.5 Domestic Firms

A domestic firm is set up by a domestic entrepreneur who becomes owner and manager of that firm. The investment I needed to set up a firm can be financed out of wealth or by borrowing on the credit market. A loan contract specifies a loan D and a repayment R to be paid to the creditor unless the entrepreneur defaults. A default occurs when an entrepreneur reneges on outstanding payments, loan repayments or wages. A labor contract specifies a wage v to be paid to the worker in case of no default. If the project fails output is 0 and the entrepreneur necessarily defaults if her wealth does not suffice for all payments, $\omega_i < I + rv$. Denote the expected wage by $\bar{v}$.

Given labor and loan contracts, and supposing that the entrepreneur will

[9] Exogeneity of the interest rate is not driving our results on the dynamics, cf. Section 6, where the interest rate is allowed to vary.

announce the state of the firm truthfully, she chooses effort q if

$$q(Y-R-v)-k+r(\omega_i-(I-D))-(I-D)\geq r(\omega_i-(I-D))-(I-D).$$

Hence, $e=q$ if $q(Y-R-v)>k$, and $e=0$ otherwise. Since loan and labor markets are competitive, $R+v=(rD+\bar{v})/q$, where $D=\max\{I-\omega_i;-\bar{v}/r\}$. Therefore $e=q$ is implementable for all $\omega_i\geq 0$.

Loan contracts must satisfy incentive compatibility ex post by ensuring that a successful entrepreneur does not find it profitable to abscond:

$$(1-\delta)Y\leq Y-R-v=Y-\frac{\max\{rI+\bar{v}-r\omega_i;0\}}{q}$$

This means credit is restricted to agents with sufficient wealth

$$\omega_i\geq I+\bar{v}/r-q\delta Y/r:=\hat{\omega}(\bar{v}), \tag{CR}$$

If $rI+s>\delta qY$, condition (CR) has a bite and some agents cannot obtain a loan as $\hat{\omega}(\bar{v})>0$. Further parametrical assumptions sufficient but by no means necessary for our reasoning are summarized as follows.

Assumption 1 *Let the following parametrical assumptions hold.*

(i) $rI+s>\delta qY$,

(ii) $(q+\beta r)rI-(q-\beta r)k<(2\delta q-(q-\beta r))qY$,

(iii) $(2-\beta r)rI+2(1-\beta r)s>(2(1-\beta r)\delta+\beta r)qY+\beta rk(2-q)/q$,

(iv) $\beta r<1/2<q$.

Part (ii) ensures that all successful workers obtain high enough income to enable their offspring to become entrepreneur, while (iii) implies that this is not necessarily the case when obtaining a high wage with certainty. Part (iv) implies that a firm size of two suffices for trickle down growth.[10] Notice that (i) implies (iii) when $\beta>0$ is small enough. A sufficient condition for (ii) when β is approaching zero is $(1-\delta)qY<(s+k)$. That is, an economy where Assumption 1 holds is characterized, for instance, by a very low saving rate, effective borrowing constraints for the poor, and a technology where labor constitutes a substantial share of input cost.

[10] $q<1/2$ requires firms with more than one worker.

4 The Domestic Economy in Autarky

We first analyze the growth path of the domestic economy without foreign direct investment. Key to the dynamics is the labor market equilibrium.

4.1 Labor Market

An agent i who chooses to become a worker has expected earnings $r\omega_i + s$ if working in subsistence, and $r\omega_i + \bar{v}$ if working in a firm. An agent j who becomes an entrepreneur has expected earnings $r\omega_j + qY - rI - \bar{v}$.

The expected wage $\bar{v}$ is determined on the labor market. Labor demand is given by the measure of agents choosing to be entrepreneurs at expected wage $\bar{v}$. An agent finds it profitable to start a firm and exert effort q if

$$r\omega_i + qY - rI - \bar{v} - k \geq r\omega_i + \bar{v},$$

which is equivalent to

$$\bar{v} \leq (qY - rI - k)/2 := \bar{v}_q.$$

$\bar{v}_q$ is the highest wage consistent with a positive measure of entrepreneurs in firms that implement effort q. As Assumption 1(i) implies that the poorest agents are credit constrained, we can state the following proposition.

Proposition 1 (Credit Rationing) *If $\bar{v} < \bar{v}_q$ there is credit rationing, in that an agent i with wealth $0 \leq \omega_i < \hat{\omega}(\bar{v})$ strictly prefers to become entrepreneur but cannot obtain a loan and becomes worker.*

Labor demand thus depends on the borrowing constraint $\hat{\omega}(.)$ and is given as follows.

$$L^D = \begin{cases} 1 - G(\hat{\omega}(\bar{v})) & \text{if } 0 \leq \bar{v} < \bar{v}_q, \\ [0, 1 - G(\hat{\omega}(\bar{v}_q))] & \text{if } \bar{v} = \bar{v}_q, \\ 0 & \text{if } \bar{v} > \bar{v}_q. \end{cases} \tag{1}$$

Likewise, labor supply is the measure of agents who choose to work at $\bar{v}$:

$$L^S = \begin{cases} 0 & \text{if } \bar{v} < s, \\ [0, G(\hat{\omega}(s))] & \text{if } \bar{v} = s, \\ G(\hat{\omega}(\bar{v})) & \text{if } s < \bar{v} < \bar{v}_q, \\ [G(\hat{\omega}(v_p)), 1] & \text{if } \bar{v} = \bar{v}_q, \\ 1 & \text{if } \bar{v} > \bar{v}_q. \end{cases} \tag{2}$$

Since $\hat{\omega}(\bar{v})$ is strictly increasing in $\bar{v}$, a market clearing expected wage $\bar{v}^*$ exists and is given by

$$\bar{v}^* = \begin{cases} s & \text{if } G(\hat{\omega}(s)) \geq 1/2, \\ \bar{v} : G(\hat{\omega}(\bar{v})) = 1/2 & \text{if } G(\hat{\omega}(s)) < 1/2 \leq G(\hat{\omega}(\bar{v}_q)), \\ \bar{v}_q & \text{if } G(\hat{\omega}(\bar{v}_q)) \leq 1/2. \end{cases} \tag{3}$$

Hence, in a labor market equilibrium entrepreneurs with wealth $\omega_j \geq I + \bar{v}^*/r$ pay wage $\bar{v}^*$ with certainty, entrepreneurs with $I + \bar{v}^*/r > \omega_j \geq I$ pay $(\bar{v}^* - r(I - \omega_j))/q$ in case of success and $r(I - \omega_j)$ in case of failure, and those with $\omega_j < I$ pay $\bar{v}^*/q$ in case of success and 0 in case of failure.

4.2 Dynamics

In order to keep the analysis tractable we focus on the dynamic evolution of the measure of potential entrepreneurs in firms with $\omega_j \leq I$. That is, all entrepreneurs have to borrow to finance the project.[11]

Assumption 2 (Dynamics) *Let* $Y - s/q < \frac{I}{\beta}$ *and* $G_0(I) = 1$ *in period* 0.

This assumption facilitates the analysis of the dynamic behavior of the economy considerably implying that individual wealth is bounded above by I.

Lemma 1 *Under Assumption 2, in any period* $t > 0$ *all entrepreneurs choose effort* q *and pay wage* $\bar{v}_t^*/q$ *in case of success and* 0 *otherwise.*

Proof: A successful entrepreneur i with $\omega_{i,t} \leq I$ bequeathes less than I if

$$\beta(Y - (r(I - \omega_{i,t}) - \bar{v}_t^*)/q) < I,$$

which is implied by $Y - s/q < I/\beta$. Since income in this economy strictly increases in wealth (as $qY - \bar{v} - rI - k \geq \bar{v}$), if initial period endowments are bounded above by I, $\omega_{i,0} \leq I$, then they are bounded above by I in any period, $\omega_{i,t} \leq I$ for all $t > 0$. □

As any period's allocation is governed by the endowment distribution, the individual wealth transition determines the dynamics of the model. A worker i with $0 \leq \omega_{i,t} < \hat{\omega}(\bar{v}_t^*)$ in a successful firm obtains $r\omega_{i,t} + \bar{v}_t^*/q$.

[11] As the dynamic effect of foreign direct investment works through the measure of potential debt-financed entrepreneurs, the presence of self-financed entrepreneurs may affect the magnitude of the effect, but not its direction.

This gives the worker's offspring sufficient endowment to qualify as an entrepreneur given this period's wage if $\beta(r\omega_{i,t} + \bar{v}_t^*/q) \geq \hat{\omega}(\bar{v}_t^*)$, that is

$$\omega_{i,t} \geq \frac{q - \beta r}{q\beta r}\bar{v}_t^* - \frac{\delta qY - rI}{\beta r} := \tilde{\omega}(\bar{v}_t^*). \tag{4}$$

A sufficient condition for $\tilde{\omega}(\bar{v}_t^*) \leq 0$ for all $\bar{v}_t^* \in [s; \bar{v}_q]$ is $(q + \beta r)rI - (q - \beta r)k < (2\delta q - (q - \beta r))qY$. This is implied by part (ii) of Assumption 1.

A successful entrepreneur j obtains income $Y - r(I - \omega_{j,t}) - \bar{v}_t^*/q$. Since income strictly increases in wealth, $\omega_{j,t} \geq \tilde{\omega}(\bar{v}_t^*)$ implies that also j's offspring may become entrepreneur (given wage $\bar{v}_t^*$).

Finally, an entrepreneur i in an unsuccessful firm earns 0 and bequeathes 0. Hence, occupational choice of the present generation determines the next generation's endowments $\omega_{i,t+1}$ as follows:

(i) workers in successful firms: $\omega_{i,t+1} \geq \hat{\omega}(\bar{v}_t^*) \Leftrightarrow \omega_{i,t} \geq \tilde{\omega}(\bar{v}_t^*)$,

(ii) workers in unsuccessful firms: $\omega_{i,t+1} < \hat{\omega}(\bar{v}_t^*) \Leftrightarrow \omega_{i,t} < \hat{\omega}(\bar{v}_t^*)/(\beta r)$,

(iii) entrepreneurs in successful firms: $\omega_{i,t+1} \geq \hat{\omega}(\bar{v}_t^*)$,

(iv) entrepreneurs in unsuccessful firms: $\omega_{i,t+1} = 0$.

This means that for every successful firm in period t there are at least $2q$ potential entrepreneurs in period $t+1$, so that more and more agents outgrow the borrowing constraint $\hat{\omega}(\bar{v}_t^*)$. Hence, next period's labor market wage is weakly greater than today's, $\bar{v}_{t+1}^* \geq \bar{v}_t^*$, which holds with equality if $\bar{v}_t^* = \bar{v}_q$. This gives rise to the following proposition.

Proposition 2 (Steady State Autarky) *Suppose that* $(q + \beta r)rI - (q - \beta r)k < (2\delta q - (q - \beta r))qY$. *In a steady state of the domestic labor market under autarky, measure* $1/2$ *of the population become entrepreneur, the market wage is* $\bar{v}_q$, *and aggregate investment is* $I/2$ *yielding aggregate output* $qY/2$. *In a steady state it holds for the wealth distribution that* $G(\hat{\omega}(\bar{v}_q)) > 1/2$.

Proof: In Appendix.

Figure 2 provides an illustration of the dynamics under autarky obtained from a numerical example. A worker in a successful firm bequeathes sufficient wealth to enable his offspring to become entrepreneur. The parametrization is chosen such that $\omega_{i,t+1} > \hat{\omega}(\bar{v}_q)$. The contrary holds when obtaining the domestic expected market wage with certainty.

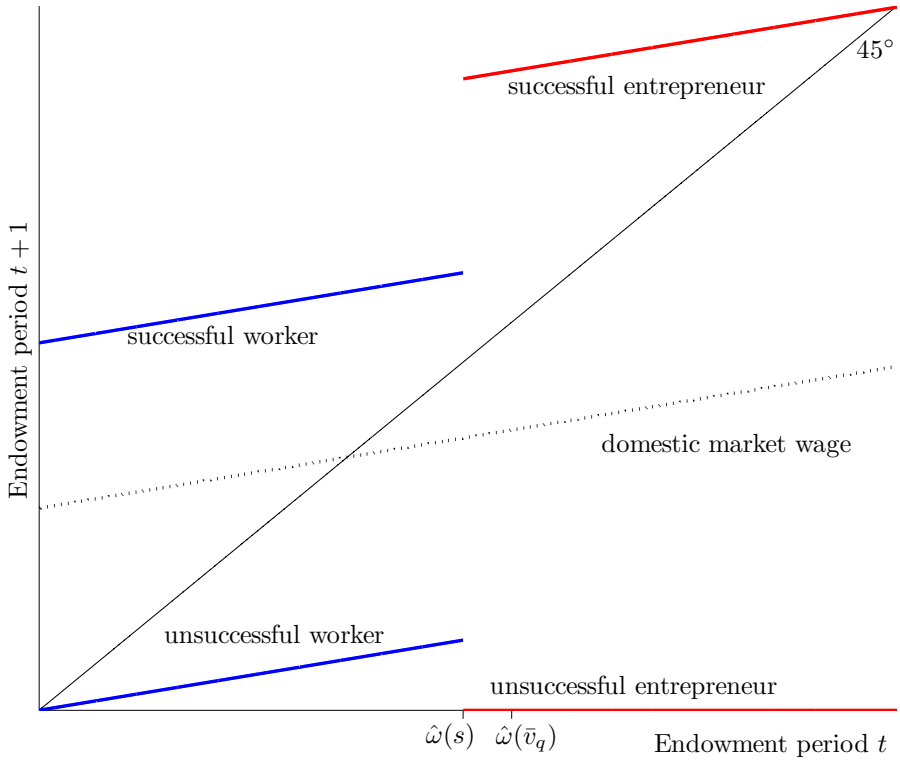

Figure 2: Intergenerational wealth transition under autarky

5 Foreign Direct Investment

This section allows for direct investment by foreign firms in the form of setting up a foreign owned firm in the domestic economy that employs domestic agents as manager and worker.

5.1 Foreign Firms

A foreign owned firm uses the same technology as a domestic firm.[12] That is, a manager and a worker jointly produce stochastic output. The success probability, q or 0, depends on the unobservable effort of the manager as above. In contrast to domestic firms, foreign owners have access to frictionless foreign capital markets (or the internal capital market of a multi-

[12] Using a continuity argument one can show that our framework accommodates a small but positive technological advantage conveyed by foreign ownership translating into higher wages in foreign firms without altering the main finding. Absent further heterogeneity, e.g. exact compensation of the advantage by access cost or a taste preference of agents for domestic firms, this leads to a counterfactual complete crowding out of domestic firms.

national), which is embodied in a foreign owner's probability of successfully absconding of $1 - \delta_F = 0$. Therefore domestic agents employed in a foreign firm, in particular managers, are not subject to domestic capital market imperfections and thus bypass the domestic capital market.

Moreover, foreign firms can commit on servicing outstanding payments even in case of a project's failure. This is best motivated by assuming that a foreign firm is able to diversify the risk of its projects. Findings by Acharya et al. (2009) indicate this is indeed the case as firms accessing capital markets with better creditor rights protection take on less risk. For instance, a foreign owner may fund a large number of projects in the domestic economy (and possibly also in the foreign one). If these projects' successes are independent events, the law of large numbers applies and the distribution of aggregate revenue approaches probability one on its expected value. Hence, funding a measure m of projects a foreign owner's revenue is mqY. The foreign owner finds it profitable not to abscond for all level of debt since $\delta_F = 1$.[13]

5.2 Labor Market

That is, a foreign firm can offer wages v_M for the manager and v_W for the worker, and bonuses b_M and b_W contingent on the outcome of project. As workers' effort has no effect on the success probability, $b_W = 0$. In order to induce the manager to exert effort q incentive compatibility has to hold:

$$qb_M \geq k. \tag{ICF}$$

The foreign owner of such a firm obtains expected profit

$$E[\pi] = qY - v_W - v_M - qb_M - rI.$$

Suppose that foreign firms can enter the domestic economy at zero cost.

Assumption 3 (Free Entry) *The measure of potential foreign owners is greater than* $1/2$ *and* $E[\pi] = 0$.

Here an important feature of foreign ownership is the absence of barriers to entry to the profession of manager, implying that managers do not obtain rents.[14] Managers' and workers' wages thus make agents indifferent between

[13] Note that under our assumption on δ a domestic agent with $\omega_i \leq I$ cannot commit to pay $2I - \omega_i + 3\bar{v} + k$ in case of success, preventing diversification by domestic owners.

[14] Alternate formulations could confer a comparative advantage to wealthy individuals. In particular, the investment I may be in human capital. This may give rise to rents for wealthy individuals and thus depress wages compared to our analysis. Since the results would not change qualitatively we avoid this complication here.

each occupation. This intuition underlies the following proposition.

Proposition 3 *Let free entry hold in a period t. Then the market wage is $\bar{v}_q$, investment $I/2$, and output $qY/2$. Domestic agents with $\omega_i < \hat{\omega}(\bar{v}_q)$ become employees, i.e. workers in domestic or foreign firms, or managers in foreign firms. Domestic agents with $\omega_i \geq \hat{\omega}(\bar{v}_q)$ are indifferent between becoming entrepreneurs or employees.*

Proof: Since all agents can be manager or worker, in a labor market equilibrium agents must be indifferent between becoming a manager and a worker, that is $v_M + qb_M - k = v_W$. With free entry $v_W = (qY - rI - k)/2 = \bar{v}_q$, and the measure of firms is $1/2$.

At $\bar{v}_q$ domestic agents are indifferent between the roles of entrepreneur, worker and manager, but only obtain a loan if $\omega_{i,t} \geq \hat{\omega}(\bar{v}_q)$. An agent with $\omega_{i,t} < \hat{\omega}(\bar{v}_q)$ cannot become entrepreneur; therefore these agents become employees, either workers in domestic or foreign firms, or managers in foreign firms. □

That is, free entry of foreign direct investment effectively bypasses the capital market imperfection and the domestic economy instantaneously converges to its steady state.

5.3 Dynamics

Proposition 3 pins down the steady state labor market allocation in terms of wage, investment and output. To compare the dynamics of the wealth distribution with and without foreign direct investment consider the bequests of domestic agents earning a wage $\bar{v}_q$, i.e. workers and unsuccessful managers in foreign firms. Such agents with $\omega_{i,t} \leq \hat{\omega}(s)$ bequeath too little for their offspring to become entrepreneurs even in a low wage market equilibrium if

$$\beta r\hat{\omega}(s) + \beta(\bar{v}_q + k/q) < \hat{\omega}(s).$$

That is,

$$\beta r(qY - rI + (2-q)k/q) \leq 2(1-\beta r)\left(rI + s - \delta qY\right),$$

which is implied by part (iii) of Assumption 1. This implies also that a manager who is perpetually lucky and obtains wage $\bar{v}_q + k/q$ in every period has wealth less than $\hat{\omega}(s)$, leading to the following statement.

Lemma 2 (Wealth Dynamics and FDI) *Let free entry hold in a period t. Then, if agent i is member of a foreign owned firm $\omega_{i,t} \leq \hat{\omega}(s)$ implies $\omega_{i,t+1} \leq \hat{\omega}(s)$. Moreover, $\omega_{i,t+1} < \omega_{i,t}$ if $\omega_{i,t} > \hat{\omega}(s)$.*

That is, under foreign investment the measure of agents with $\omega_{i,t} \geq \hat{\omega}(s)$ is strictly decreasing. Hence, in the long run all domestic investment will be crowded out. This is in contrast to the case of autarky where domestic investment increases in time.

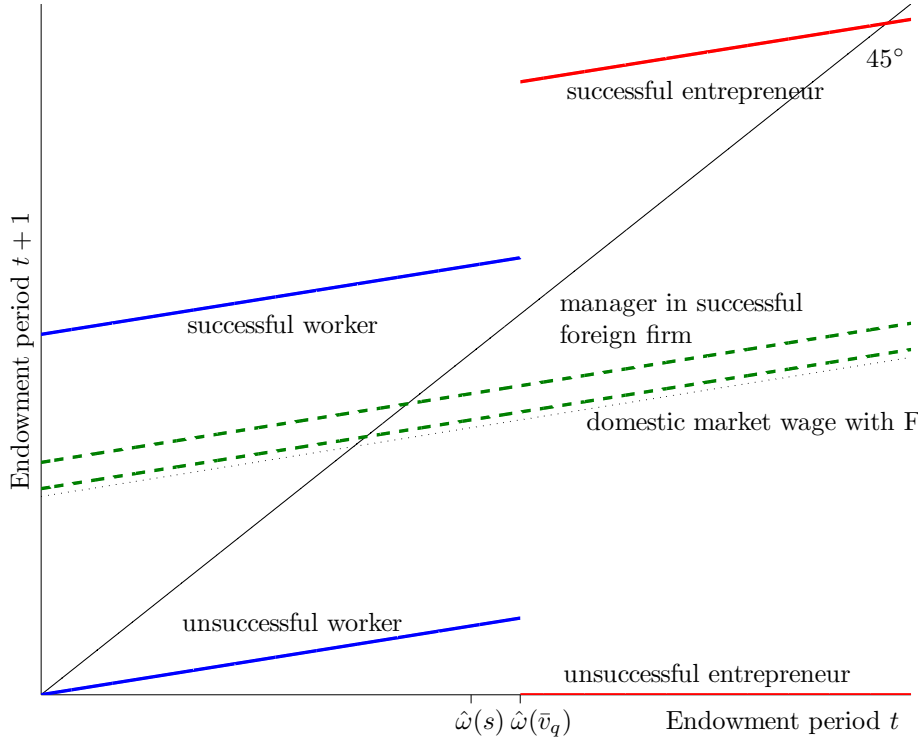

Figure 3: Intergenerational wealth transition under foreign direct investment

Figure 3 depicts the wealth transition in the numerical example allowing for foreign owned firms. Workers' success wages in domestic firms increase as entrepreneurial rents are competed away. Foreign firms pay a fixed salary to all employees and a bonus to successful managers, depicted by the dashed lines. Under our assumptions managers earning the bonus bequeath too little for their offspring to become entrepreneurs, even when $\bar{v} = s$.[15]

[15]Our argument is consistent with weakening Assumption 1 (iii) such that offspring of credit-constrained, successful managers may become entrepreneurs. The required property is that a domestic firm enables on average more agents to become entrepreneurs in the next periods than a foreign owned firm.

6 Withdrawal

As shown above the steady state labor market equilibria under autarky and foreign direct investment coincide. Free entry of sufficient foreign owners enables an economy to instantly reach the steady state with a high wage and full employment. The two regimes differ, however, in the evolution of the wealth distribution and social mobility. While in autarky high social mobility coincides with high inequality, under foreign direct investment wealth tends to be more equally distributed, and social mobility depends on the absence of barriers of entry to the role of a manager. Since wealth inequality is necessary to generate growth under autarky, more equal income distributions under foreign direct investment may render the domestic economy more vulnerable to shocks, in particular to withdrawal of foreign capital in conjunction with a tightening of access to foreign credit markets.

To demonstrate this formally assume that in a period t the domestic economy is in labor market equilibrium with free entry of foreign owners. Denote the measure of foreign owned firms in period t by μ. Assume that $G_t(\hat{\omega}(s)) > 1/2$, which ensures that potential entrepreneurs are scarce in period $t+1$.[16] Because of free entry $\mu \in [G_t(\hat{\omega}(\bar{v}_q))-1/2, 1/2]$, since domestic entrepreneurs are scarce also in t. Consider now the effect of a withdrawal of a fraction $p \in (0,1)$ of foreign owners. This could be due to a productivity shock in a foreign country, a shock to the opportunity cost of capital for foreign owners, or a international liquidity shock. Often this is accompanied by an increase in the interest rate domestic borrowers face when borrowing on foreign credit markets, that is the international interest rate may increase. Hence, a withdrawal, or sudden stop, in period $t+1$ is characterized by $\mu_{t+i} = (1-p)\mu$ and $r_{t+i} = r' \geq r$, $i = 1, 2, ...$ Let $r' \leq (q\delta Y - s)/(I - \beta r s/q)$ to ensure that a recovery actually takes place.

In period $t+1$ the demand for labor is $(1-p)\mu + (1 - G_{t+1}(\hat{\omega}_{t+1}(\bar{v})))$, with $\hat{\omega}_{t+1}(\bar{v}) = I + (\bar{v} - \delta q Y)/r'$. If

$$1/2 - (1-p)\mu - (1 - G_{t+1}(\hat{\omega}_{t+1}(s))) > 0, \tag{5}$$

both investment and output decrease in period $t+1$, since labor is underutilized. Note that expression (5) gives also exactly the percentage decreases in output.

[16] This is the case, for instance when an economy is exposed to foreign direct investment at an relatively early stage of development when it is relatively poor, see Lemma 2.

6.1 Recovery after Withdrawal

Suppose that output decreased in period $t+1$, i.e. condition (5) holds. This in turn implies $\bar{v}^*_{t+1} = s$. Parts (i) and (iv) of Assumption 1 imply that $\beta r I + \beta s < \hat{\omega}(s)$ and thus only sufficiently wealthy successful managers in foreign firms and members of a successful domestic firm may become entrepreneurs in $t+2$. Since labor is under-utilized, all agents with $\omega_{i,t+1} \geq \hat{\omega}(s)$ become domestic entrepreneurs. Since part (iii) of Assumption 1 implies that $\beta r \hat{\omega}(s) + \beta(s + k/q) < \hat{\omega}(s)$, at wage s even successful managers in foreign firms bequeath too little for their offspring to become entrepreneur. That is, the general equilibrium effect of a sudden stop depresses wages and thus resurrects rents for domestic entrepreneurs.

But then the measure of domestic entrepreneurs in $t+1$, $1-G_{t+1}(\hat{\omega}_{t+1}(s))$ completely determines the speed of recovery. Indeed this measure depends negatively on the measure of foreign firms in t, μ. That is, μ has a negative effect on re-building the stock of domestic entrepreneurs in the aftermath of a sudden stop. On the other hand, holding constant the outflow of owners p in period t, by (5) the higher the measure of foreign owners μ in t, the lower the drop in output. This implies that, when holding constant the decrease in output in $t+1$, a higher measure of foreign owners μ in period t unambiguously slows down the speed of recovery, while a qualifier is needed for an unconditional statement. In order to pin down the endowment distribution of the next generation we need to specify the assignment of indifferent agents to occupational roles in the following assumption.

Assumption 4 (Assignment) *Rationing of potential entrepreneurs into entrepreneurship, and of agents to the role of manager in foreign firms is uniform and independent.*

This is consistent with all agents first applying for a job as manager in a foreign firm, and potential entrepreneurs who are not hired as managers selecting into entrepreneurship. Note that this requires the measure of potential domestic entrepreneurs to be higher than the number of domestic firms. This particular method of rationing is not crucial for the next result, which is proved in the appendix; assuming independence in rationing is convenient for calculating marginal effects, however.

Proposition 4 *Let Assumptions 1 – 4 hold, $\mu_{t+\tau} = (1-p)\mu$ and $r_{t+\tau} = r' \geq r$ in periods $\tau = 1, 2, ...$ Let output decrease in $t+1$. Holding constant*

the output decrease or if it is sufficiently great, the number of periods until output recovers to the period t level increases in μ, δ, and r'.

That is, exposure to foreign direct investment incurs a risk of adverse real consequences should foreign investment be suddenly withdrawn. Withdrawal may reintroduce credit rationing and thus reduce domestic output.[17] Indeed under our assumptions high variation in payoffs across domestic firms, which ensures sufficient concentration of high wealth in the next period's endowment distribution, provides a form of insurance against sudden outflows.

Note that the proposition can be extended to a setting with an endogenous interest rate from period $t+1$ onwards. A sufficiently efficient credit market ensures that all capital is invested if it is scarce, and recovery time depends only on aggregate capital in $t+1$. When the credit market is imperfect, however, credit rationing causes some wealth to lie idle despite scarcity of capital. Then recovery time depends negatively on the measure of potential entrepreneurs in period $t+1$ as above.

The severity of credit rationing in case of withdrawal depends also on the degree of credit market imperfections. As credit market frictions become less severe, the detrimental effect of past foreign direct investment on recovery time is partially mitigated, since the measure of rationed agents $G_{t+1}(\hat{\omega}_{t+1}(s))$ strictly decreases in δ. This argument holds for the marginal effects of a change in δ while Assumption 1 holds. Of course, an increase in δ can also have a discrete effect: if the increase is sufficient to ensure that all members of foreign firms leave enough for their offspring to become entrepreneurs, recovery time decreases in the initial measure of foreign firms μ. This reasoning yields the following corollary, see appendix for details.

Corollary 1 (Capital Market Imperfection) *The effect of an increase in μ on the duration to recovery is less pronounced the higher δ. If δ is sufficiently high the time to recovery decreases in μ.*

That is, the stylized theoretical model predicts that the duration to recovery is linked to the exposure to past foreign direct investment. In particular, past foreign direct investment extends the duration to recovery in economies with severe capital market frictions. This effect is dampened

[17] See Eichengreen and Leblang (2003) who report a twofold effect of capital account liberalization: it seems to be associated both with efficiency gains in the domestic economy and an amplification of adverse effects due to crises.

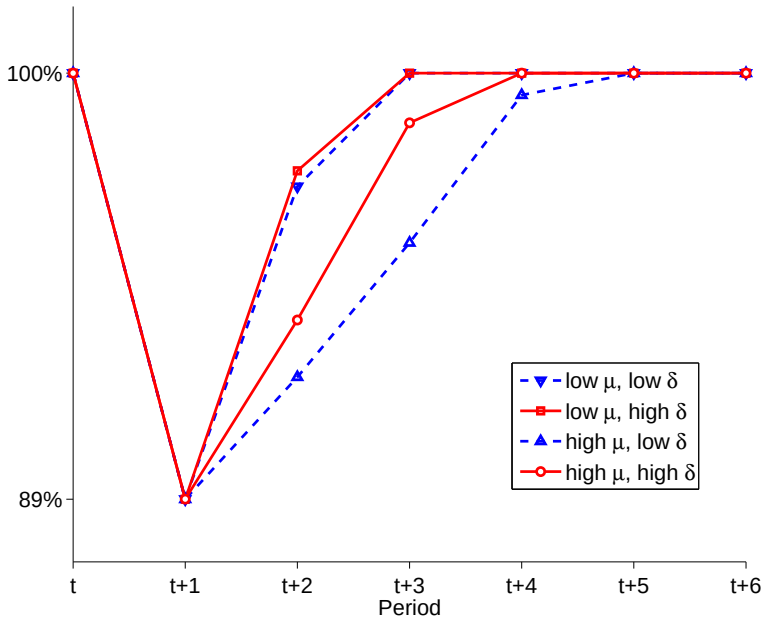

Figure 4: Output after FDI withdrawal contingent on μ and δ.

or even reversed in economies where capital market frictions are less pronounced. The degree of capital market imperfection in this model, i.e. the probability δ of preventing evasion of a borrower, can be understood as the quality of creditor rights.

Figures 4 and 5 depict output growth after a sudden withdrawal of foreign capital, depending on the initial measure of foreign firms μ. Important for comparison with the empirical results below are the *growth rates immediately after the withdrawal* (i.e. the slopes from period $t+1$ to $t+2$). Figure 4 illustrates Corollary 1 in that a change of μ has ceteris paribus a bigger impact for economies with more severe capital market frictions, that is lower δ. Figure 5 compares a situation where the international interest rate faced by domestic firms remains unchanged ($r' = r$) to a situation where the foreign capital withdrawal is accompanied by a shock to the interest rate for borrowing in foreign credit markets ($r' > r$).

6.2 Systemic Sudden Stops and the Duration of Recovery

These theoretical results link the duration of recovery after a sudden withdrawal of foreign capital to previous foreign capital inflow and credit market frictions. In particular, Proposition 4 and Corollary 1 state that past foreign capital inflows have an adverse effect on the duration of recovery in the

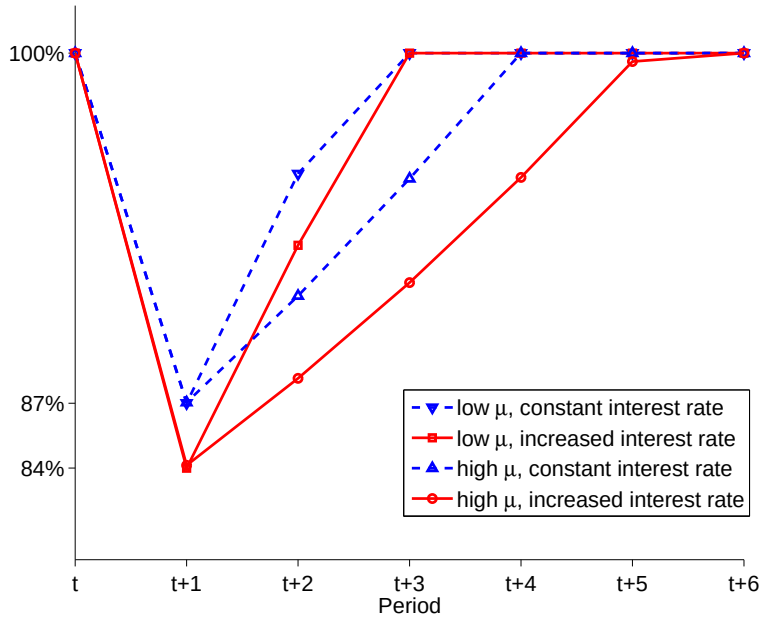

Figure 5: Output after FDI withdrawal contingent on μ and r'.

presence of domestic credit market frictions.

A straightforward way to test these prediction is using data from systemic sudden stop episodes and subsequent recoveries. Calvo et al. (2006) identify 33 episodes of systemic sudden stops that are followed by an output recovery not relying on regaining access to foreign capital markets, termed "Phoenix Miracles". The authors define systemic sudden stops as periods of capital inflow collapse and skyrocketing emerging markets aggregate bond spreads that affected a range of countries at approximately the same time and, thus, had a systemic component. Accordingly, post-war history and data requirements limit our sample to 33 episodes. Therefore, we emphasize that our estimation results should be regarded as indicative rather than concluding. However, we have recently observed substantial outflows of foreign capital in a number of emerging markets due to the financial crisis. The availability of data for the current episodes will effectively increase our sample and thus finally allow for a more concluding empirical analysis in the near future.

For each of these 33 episodes, we compute the duration (in years) until output has returned to its pre-crises level based on the Penn World Table data on real GDP per capita.[18] Our computations are based on PPP

[18] After the systemic sudden stop in Argentina 1982 output did not fully recover before

adjusted real GDP data, since nominal exchange and inflation rates can fluctuate dramatically during systemic sudden stop episodes. Moreover, we use per capita data since fast population growth in some countries would otherwise bias the durations until full output recoveries downward.[19]

We measure the degree of a country's credit market imperfections using data on creditor rights protection, which are taken from Djankov et al. (2007) (the variable is re-defined such that higher values correspond to a lower degree of financial development). FDI inflows are taken from UNCTAD (2007). We consider FDI inflows in the past five (ten) years before a systemic sudden stop to capture a country's past exposure to foreign investment. Hence, it is safe to argue that both variables of interest, creditor rights protection and past FDI, are exogenous to the event of a financial crisis. In addition we consider the following control variables: the drop in real GDP from the pre-crises level to the through of the crises, the level of real GDP, private investment as a share of GDP, trade as a share of GDP, and terms of trade. Concerning the possibility of reverse causality note that this requires that factors leading to faster output recovery also led to higher FDI in the past – the most likely candidate is openness, which we control for. The first two variables are obtained from the Penn World Table (Heston et al., 2006), the last two from the World Development Indicators. Real GDP per capita reflects the market size which could mitigate the impact of a sudden stop due to scale effects. Similarly, a higher degree of private investments, trade openness, and more beneficial terms of trade are associated with a quicker period of recovery. Finally, we include regional dummy variables for Asia, Africa and Latin America as well as a time dummy for the 1980s.

Table 3 reports the episodes of systemic sudden stops following the definition of Calvo et al. (2006). The duration to a full output recovery was longest in El Salvador, Nigeria, and Uruguay in the 1980s, while for a number of systemic sudden stop episodes it was relatively short (two to three years). The largest output drops from peak to trough amount to approximately 20% of GDP per capita (Uruguay and Chile in the early 1980s, and Argentina in the late 1990s). Table 3 shows that the protection of creditor rights and the preceding ratios of FDI over GDP vary substantially across

the country was hit by another sudden stop. In this case, we take the observation showing the highest value of output prior to the next sudden stop as the full recovery point.

[19] We emphasize that we obtain the same qualitative result as in Table 4 if we base the durations on absolute real GDP levels (instead of per capita levels) or if we alternatively use PPP-adjusted real GDP data from the World Development Indicators.

the different episodes. In particular, the highest rates of past FDI in countries with weak creditor rights are observed in Argentina (1998), Colombia (1998), Ecuador (1998), Mexico (1994), Peru (1997), and Tunisia (1981).

We estimate a generalized negative binomial regression model with duration until output has returned to its pre-crisis level as a dependent variable. The choice of model is based on the assumption that the distribution of durations is well-represented by a Poisson-like process, which accounts for the fact that the probability of an output recovery increases over time during a recovery period. This interdependence can lead to extra variation which is referred to as over-dispersion. This distributional assumption is quite general and appears to be appropriate for our setting. Moreover, we always include heteroscedasticity robust standard errors clustered by years to allow for a correlation of macroeconomic shocks across countries in a given year. In particular, we correct standard errors for contagion effects during the Asian crisis episode which led to systemic sudden stops in Indonesia, Malaysia, Peru, the Philippines, and Russia in 1997.[20]

6.3 Empirical Results

Table 4 lists the results for the generalized negative binomial regression model. The first two columns show that past foreign investments, on average, do not affect the length of the recovery period. However, the positive significant interaction term with creditor rights in column two reveals that past foreign investments prolong the duration until a full output recovery if a country lacks creditor rights. In particular, past FDI reduces the length of a recovery period if creditor rights are relatively well protected ($\texttt{CR} \in \{0; 1; 2\}$) and prolongs this period if they are not ($\texttt{CR} \in \{3, 4\}$). Columns three and four of Table 4 report that the interaction term remains significant at a 5% level if we include time and region dummies or additional control variables. We note that the qualitative results in column three, which refers to our baseline specification, are robust to the successive exclusion of one country at a time from the sample.[21] Interestingly, the direct effect of better pro-

[20] The clustering tends to reduce the standard errors which highlights the importance of contagion effects across countries in a given year. We note, however, that the interaction term between past FDI and creditor rights is also positive and significant in our basic specifications if we do not cluster the standard errors, or if we impose alternative clustering schemes (e.g. by decade, region, or country).

[21] This robustness check refers to 23 additional estimations. The results are available from the authors upon request.

tection of creditor rights tends to be prolonging the duration to recovery once we control for the interaction effect between creditor rights and past exposure to FDI. This may be explained by a costly state verification argument: better creditor rights amount to higher degree of monitoring and inspection, which in turn generate higher cost in case of default, for instance in form of time-consuming bankruptcy procedures that tie up capital needed elsewhere. Substantiating the evidence on such a trade-off between static (quick reallocation of capital) and dynamic (incentives for borrowers not to strategically default) may provide an interesting opportunity for future research.

In the last two columns of Table 4, we use the average foreign investments over the past decade rather than over five years. The interaction term remains significant at the 5% level controlling for the drops in output during the crises. Furthermore, in the columns five and six of Table 4, we repeat the exercise based on the interaction of past trade with creditor rights instead of FDI. In fact, the interaction term between past trade and creditor rights is never significant at conventional levels, which supports the FDI mechanism present in our model.

Finally, we explicitly allow for a non-linear relationship between past FDI and creditor rights protection in regressions reported in Table 5. For the left half of the table we separate countries in two groups based on the degree of creditor rights protection. This is captured by the dummy variables: `CRgood`, which is 1 if `CR` $\in \{0; 1; 2\}$ and 0 otherwise, and `CRbad`, which is 1 if `CR` $\in \{3; 4\}$ and 0 otherwise. The first group covers 15 and the second one 18 observations. We find that past FDI does not influence the duration to output recovery when creditor rights are relatively well protected. In contrast, past FDI prolongs the recovery time when creditor rights protection is weak. The corresponding coefficient is significant at a 1% level.

The right half of Table 5 shows results when including a dummy and the corresponding interaction term of that dummy with past FDI for each of the five realizations of `CR`.[22] The results reveal that the average effect in Table 4 conceals a significant degree of nonlinearity. It turns out that the effect of past FDI on the duration to a full output recovery is increasingly deteriorating with the lack of creditor rights protection. The increase in the time to full recovery due to past FDI is most pronounced when creditor rights

[22]The best realization of creditor rights protection is achieved in 2 cases, the second best in 7, the intermediate in 6, and the two worst realizations in 9 episodes in each case, respectively.

drop from the second worst to the worst realization. The corresponding coefficients are all significant at conventional levels, apart from the interaction terms with the first three creditor rights realizations ($\texttt{CR} \in \{0; 1; 2\}$), which are only significant on a 10% level. Overall, the effect of past FDI turns to prolong the duration of output recoveries in countries where creditor rights are worse than their best two realizations (which corresponds to $\texttt{CR} \in \{2; 3; 4\}$).

7 Conclusion

This paper has analyzed the effects of foreign direct investment on the wealth dynamics of an economy with imperfect credit markets. Credit market imperfections assign debt-financed entrepreneurs an important role for the intertemporal accumulation of capital. Due to the lack of opportunities for diversification wages induce unnecessarily high-powered incentives for workers. This in turn allows successful workers' offspring to become entrepreneurs in the next period, ensuring a stock of potential entrepreneurs in the next period. In contrast, foreign owned firms can set wages to provide adequate incentives due to access to a superior capital market. This reduces the variance of the wage profile for workers, but implies lower success wages. Yet this reduction in individual income risk generates higher vulnerability to aggregate shocks, as higher exposure to foreign investments tends to prolong the time to recovery after sudden stops.

In setting up the theoretical model we favored ease of exposition over generality. The model can, however, be extended in several directions qualitatively maintaining the results presented here. For instance, firms could have an additional, superior technology choice enabling higher returns on investment if accompanied by higher effort investment of the manager. This can generate a regime where foreign owned firms choose the efficient technology and a high variance wage for the manager, but not for the worker, while domestic entrepreneurs remain too poor to find the efficient technology profitable. In this regime foreign firms have high within firm wage variance, offer higher wages on average (since they choose the efficient technology), but fail to sustain a viable stock of potential domestic entrepreneurs as only successful managers' offspring may become entrepreneurs. Foreign firms then crowd out domestic debt-financed entrepreneurs (De Backer and Sleuwaegen, 2003, offer some evidence for such a contemporaneous crowding out in Belgium.). Moreover, managers in foreign firms may earn rents in this regime, since the

optimal incentive contract may require the manager to invest some of his wealth in the firm.

Two more observations appear to be worth mentioning. First, foreign direct investment tends to increase workers' payoffs while decreasing entrepreneurs' payoffs. Hence, political acceptance of foreign direct investment increases as the pivotal agent's wealth decreases, i.e. when extending the franchise to the poor. Second, in the equilibrium with foreign direct investment positive net portfolio investment from the domestic into the foreign economy may outweigh net foreign direct investment, which is consistent with the observation by Lucas (1990). Intuitively, multinationals incorporate and collect capital on the more developed foreign capital market.

Finally, not only does the ongoing global financial crisis demonstrate the desirability of an economy's ability to recover from a sudden stop, but also it generates additional empirical observations due to collapses in foreign capital flows to emerging markets. This will contribute to overcoming the caveat of a small sample size in our present empirical exercise, and eventually enable policy related statements based on substantiated empirical evidence.

A Mathematical Appendix

Proof of Proposition 2

By (3) in a labor market equilibrium it must hold that $\bar{v}_t \in [s, \bar{v}_q]$. Therefore

$$1 - G_{t+1}(\hat{\omega}(\bar{v}_t^*)) \geq 2q(1 - G_t(\hat{\omega}(\bar{v}_t^*))) > 1 - G_t(\hat{\omega}(\bar{v}_t^*)).$$

That is, the measure of agents willing to become entrepreneurs at wage $\bar{v}_t^*$ is greater in $t+1$ than in t. By continuity of $\hat{\omega}$ in $\bar{v}$ there exists $\bar{v}_{t+1}^* \geq \bar{v}_t^*$ that equilibrates the labor market. Hence,

$$1 - G_{t+1}(\hat{\omega}(\bar{v}_{t+1}^*)) > 1 - G_t(\hat{\omega}(\bar{v}_t^*)) \text{ if } G_{t+1}(\hat{\omega}(\bar{v}_{t+1}^*)) > 1/2,$$

implying $\bar{v}_t^* < \bar{v}_{t+1}^* \leq \bar{v}_q$. If $G_t(\hat{\omega}(\bar{v}_t^*)) > 1/2$, then $\bar{v}_t^* = \bar{v}_q = \bar{v}_{t+1}^*$. That is, next period's market wage $\bar{v}_{t+1}^*$ and the measure agents wealthy enough to become entrepreneurs strictly increase over time while $G_t(\hat{\omega}(\bar{v}_t^*)) < 1/2$ until $\bar{v}_t^* = \bar{v}_q$. The statements on investment and output follow immediately.

Proof of Proposition 4

Note first that if output decreases in $t+1$ (expression (5) is negative) the measure of firms in $t+1$ is less than $1/2$ and $\bar{v}_{t+1}^* = s$. The measure of

domestic entrepreneurs in $t+1$ is $1-G_{t+1}(\hat{\omega}(s))$, which implies that only agents with $\omega_{i,t+1} < \hat{\omega}(s)$ are members of foreign owned firms. Here we abuse notation somewhat, since the function $\hat{\omega}(\bar{v}_q)$ depends positively on the interest rate r, which might increase in $t+1$, from r to $r' \geq r$. Parts (i) and (iv) of Assumption 1 imply that $\beta r\hat{\omega}(s) + \beta s < \hat{\omega}(s)$, workers and unsuccessful managers in foreign firms bequeath less than $\hat{\omega}(s)$. By part (iii) of Assumption 1 and Lemma 2 this also holds for successful managers. Hence, potential domestic entrepreneurs in period $t+2$ have at most measure

$$1 - G_{t+2}(\hat{\omega}(s)) = 2q(1 - G_{t+1}(\hat{\omega}(s))), \tag{6}$$

as each successful domestic firm allows two agents to become entrepreneurs in the next period. The measure of domestic entrepreneurs in $t+2$ is then $\min\{1/2 - (1-\delta)\mu; 2q(1 - G_{t+1}(\hat{\omega}_{t+1}(s))\}$. Output in period $t+\tau$ is

$$\min\{1/2; (1-\delta)\mu + (1 - G_{t+\tau}(\hat{\omega}(s)))\}qY.$$

Hence, time to recovery is given by the lowest integer τ that solves

$$1 - G_{t+\tau}(\hat{\omega}(s)) \geq 1/2 - (1-p)\mu, \tag{7}$$

where we use that labor is abundant and the wage $\bar{v}^*_{t+\tau} = s$ whenever τ is less than the solution to the optimization problem in (7). Using (6) we have

$$1 - G_{t+\tau}(\hat{\omega}(s)) = (2q)^{\tau-1}(1 - G_{t+1}(\hat{\omega}(s))).$$

Clearly, τ depends negatively on $G_{t+1}(\hat{\omega}(s))$. Since output decreased in $t+1$ by assumption, $\tau > 1$.

To determine $G_{t+1}(\hat{\omega}_{t+1}(s))$, note first that measure $1/2 - \mu$ of agents are domestic entrepreneurs who must have endowments $\omega_{i,t} > \hat{\omega}(\bar{v}_q)$. Under assumption 4 any agent becomes manager in a foreign firm with probability μ. Consistence of these facts requires that

$$(1-\mu)(1 - G_t(\hat{\omega}(\bar{v}_q))) \geq 1/2 - \mu,$$

implying that the measure of potential entrepreneurs exceeds the one of actual entrepreneurs. If e.g. $\mu = 1/n$, the condition is $1/2 > 1 - G_t(\hat{\omega}(\bar{v}_q)) \geq (n-2)/(2n)$. Define cutoff endowments $\tilde{\omega}_S$ and $\tilde{\omega}_F$ implicitly by

$$\beta r\tilde{\omega}_S + \beta(\bar{v}_q + k/q) = \hat{\omega}(s) \text{ and } \beta r\tilde{\omega}_F + \beta\bar{v}_q = \hat{\omega}(s).$$

Lemma 2 implies that $\tilde{\omega}_F > \tilde{\omega}_S > \hat{\omega}(s)$ and $\tilde{\omega_F} > I$ by part (iii) of Assumption 1. Since $r' \geq r$ the measure of potential entrepreneur in $t+1$ can be calculated as follows.

$$1 - G_{t+1}(\hat{\omega}(s)) = 2q(1/2 - \mu) + \mu[q(1 - G_t(\tilde{\omega}_S)) + (1-q)(1 - G_t(\tilde{\omega}_F))].$$

Using this on (7) yields

$$(2q)^{\tau-1}\left[q-\mu q-\mu q G_t(\tilde{\omega}_S)\right] \geq 1/2-(1-p)\mu. \tag{8}$$

The RHS strictly increases in p. Since the LHS strictly decreases in μ, the condition becomes more binding as μ increases when holding constant the drop in output, i.e. $1/2-(1-p)\mu-(1-G_{t+1}(\hat{\omega}_{t+1}(s)))=const$, or when p is great enough, for instance whenever $p>1-3q/2$. Noting that $\hat{\omega}(s)$ in $t+1$ increases in r' and therefore also $\tilde{\omega}_S$ increases in r' completes the proof.

Proof of Corollary 1

The effect of a marginal increase in μ on of condition (8) is

$$(1-p)-(2q)^{\tau-1}q(1+G_t(\hat{\omega}_S). \tag{9}$$

Since $\hat{\omega}(s)$ strictly decreases in δ, so do both $\tilde{\omega}_S$ and $\tilde{\omega}_F$, and the distribution function $G_t(.)$ evaluated at these points. Therefore the marginal effect of an increase in μ_t, which is negative, is amplified as δ increases.

For the second part assume that δ such that $(2+\beta r)rI+\beta rk \leq 2s+(2\delta+\beta r)qY$. Then $\hat{\omega}(s)\leq \beta\bar{v}_q$ and

$$1-G_{t+1}(\hat{\omega}(s)) \leq (1+q)(1/2-\mu)+2\mu,$$

as domestic entrepreneurs who are not successful leave their offspring 0 endowments. Since in addition in periods $t+\tau$, $\tau=1,2,...$ some members of foreign firms may leave enough to their offspring to become entrepreneurs clearly a marginal increase of μ makes condition (8) less binding.

B Figures and Tables

Quantile Regressions of Foreign Ownership Premium

Figure 6 shows the result of an OLS estimation (dashed line) of (the log of) a firm's average wage on a dummy variable (`for-OECD`), which is 1 if a firm is foreign owned and 0 otherwise. The estimation includes the same controls as the one for Figure 1. The dotted lines display the 95% confidence intervals of the OLS coefficient. Accordingly, foreign owned firms pay, on average, higher wages than domestic firms. Figure 6 summarizes the results of 18 different quantile regressions at the 5%, 10%, ..., and 95% quantile, each based on a specification analogue to the OLS estimation, depicted by

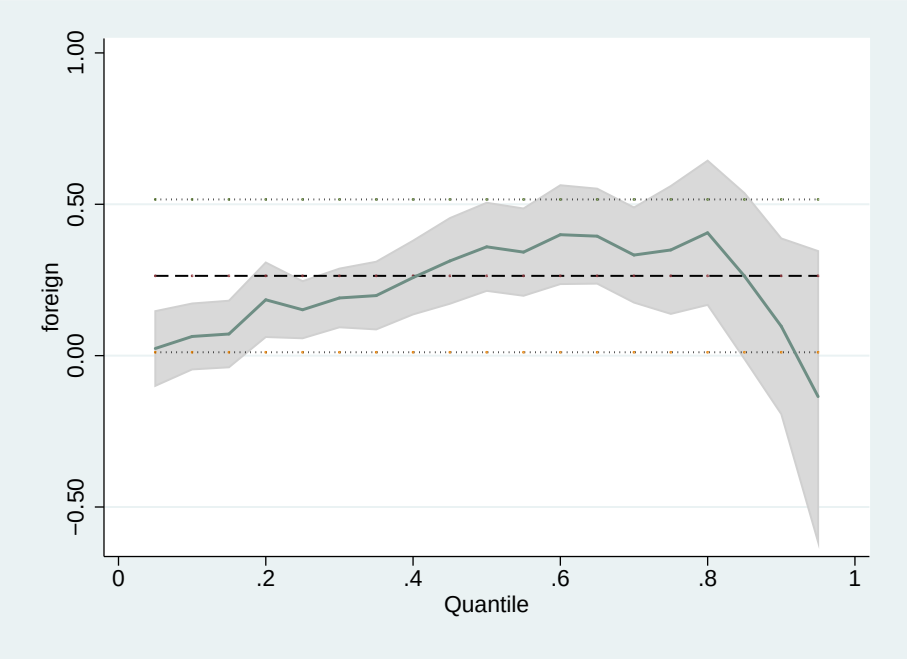

Figure 6: Quantile regression of average wages

the solid line. The shaded area marks the corresponding 95% confidence intervals. Foreign ownership appears to correlate positively with a wage premium primarily for intermediate wages, giving rise to an inverted U-shaped curve. The 95% quantile regression reveals that foreign owned firms pay lower wages than domestic firms at the top end of the wage distribution which implies that success wages are indeed higher among domestic firms.

Table 1: Effect of foreign ownership on high-level wages (> 90% quantile)

wage	(1)	(2)	(3)	(4)	(5)	(6)
hi90	3.95***	3.93***	3.83***	3.78***	3.94***	3.85***
	(12.99)	(13.37)	(13.05)	(13.53)	(9.22)	(9.75)
foroecd-lo90	.5800***		.3247***		.0756	
	(4.13)		(2.70)		(.44)	
foroecd-hi90	-.0833		-.5461		-1.05*	
	(-.30)		(-1.46)		(-1.76)	
forhq-lo90		1.04**		1.02*		-.0635
		(1.94)		(1.66)		(-0.08)
forhq-hi90		-.8785*		-1.38**		-2.42***
		(-1.87)		(-2.04)		(-5.27)
part-time			-.0030***	-.0030***	-.0288***	-.0288***
			(-2.75)	(-2.76)	(-3.09)	(-3.10)
education			.0446***	.0465***	.0679**	.0685**
			(3.76)	(3.89)	(2.35)	(2.37)
skilled			-.0007	-.0007	-.0010	-.0009
			(-.55)	(-.60)	(-.37)	(-.36)
size			.2449***	.2588***	.2452***	.2490***
			(4.35)	(4.54)	(3.38)	(3.49)
exp			.3702***	.3793***	.2489*	.2358*
			(3.56)	(3.72)	(1.89)	(1.81)
hire-restr			-.0020**	-.0019**	-.0010	-.0010
			(-2.12)	(-2.10)	(-.82)	(-.76)
stock					.2745	.2657
					(1.25)	(1.19)
fin-collateral					-.0002	-.0002
					(-.34)	(-.31)
fin-interest					-.0130**	-.0128**
					(-2.38)	(-2.35)
R2	.804	.803	.808	.808	.825	.825
Countries/Firms	27/6235	27/6235	27/4950	27/4950	27/1628	27/1628
Industry f.e.	yes	yes	yes	yes	yes	yes
Country f.e.	yes	yes	yes	yes	yes	yes

Estimation period: 2004. Heteroscedasticity robust s.e., clustered at the country and industry level. t-statistics in parenthesis. ***,**,* significant at 1%, 5%, 10%.

Table 2: Effect of foreign ownership on high-level wages (> 95% quantile)

wage	(1)	(2)	(3)	(4)	(5)	(6)
hi95	4.55***	4.49***	4.36***	4.28***	4.46***	4.41***
	(12.97)	(13.54)	(13.04)	(13.37)	(8.78)	(9.29)
foroecd-lo95	.7443***		.3780***		.0829	
	(5.21)		(3.56)		(.48)	
foroecd-hi95	-.5368		-1.05*		-.9827	
	(-1.11)		(-1.76)		(-.97)	
forhq-lo95		1.22***		.9300*		-.3524
		(2.61)		(1.83)		(-.42)
forhq-hi95		-1.39**		-1.80*		-3.22***
		(-1.98)		(-1.74)		(-6.16)
part-time			-.0031***	-.0032***	-.0299***	.0300***
			(-2.77)	(-2.78)	(-3.08)	(-3.09)
education			.0531***	.0554***	.0745***	.0742***
			(3.81)	(3.97)	(2.62)	(2.62)
skilled			-.0007	-.0008	.0003	.0003
			(-.54)	(-.64)	(.10)	(.09)
size			.2861***	.2994***	.2437***	.2429***
			(4.67)	(4.85)	(3.09)	(3.13)
exp			.4232***	.4436***	.3821**	.3871**
			(3.76)	(3.99)	(2.38)	(2.42)
hire-restr			-.0020**	-.0020**	-.0011	-.0010
			(-2.23)	(-2.20)	(-.86)	(-.85)
stock					.4358*	.4415*
					(1.66)	(1.66)
fin-collateral					-.0004	-.0004
					(-.63)	(-.65)
fin-interest					-.0054	-.0052
					(-.90)	(-.87)
R2	.783	.782	.788	.787	.808	.808
Countries/Firms	27/6235	27/6235	27/4950	27/4950	27/1628	27/1628
Industry f.e.	yes	yes	yes	yes	yes	yes
Country f.e.	yes	yes	yes	yes	yes	yes

Estimation period: 2004. Heteroscedasticity robust s.e. clustered at the country and industry level. t-statistics in parenthesis. ***,**,* significant at 1%, 5%, 10%.

Table 3: Episodes of systemic sudden stops

country	year	duration	output drop	creditor rights	past FDI/GDP
Argentina	1980	4	-12.91	3	0.36
Argentina	1994	2	-3.69	3	1.15
Argentina	1998	6	-19.89	3	2.00
Brazil	1980	5	-11.92	3	1.07
Chile	1981	5	-20.59	2	0.91
Chile	1998	2	-1.01	2	4.87
Colombia	1998	5	-2.04	4	1.92
Cote d'Ivoire	1982	4	-7.20	4	0.41
Ecuador	1981	3	-7.40	4	0.69
Ecuador	1998	6	-4.04	4	2.78
El Salvador	1980	12	-9.65	1	0.21
Indonesia	1997	5	-9.34	1	3.29
Lebanon	1999	5	-9.65	0	2.48
Malaysia	1997	2	-2.74	1	5.35
Mexico	1981	4	-10.42	4	0.66
Mexico	1994	3	-7.91	4	1.39
Morocco	1980	2	-1.17	3	0.13
Morocco	1982	2	-2.79	3	0.18
Morocco	1994	2	-8.86	3	0.72
Morocco	1996	2	-4.87	3	0.70
Nigeria	1980	11	-10.58	0	0.06
Peru	1981	5	-15.55	4	0.26
Peru	1997	5	-2.59	4	4.28
Philippines	1997	2	-5.70	3	1.25
Russia	1997	2	-2.65	2	0.36
South Africa	1981	3	1.06	1	-0.10
South Korea	1997	2	-9.02	1	0.33
Thailand	1996	6	-11.57	1	1.41
Tunisia	1981	2	-2.11	4	1.82
Turkey	1993	3	-7.20	2	0.35
Turkey	1998	2	-4.71	2	0.32
Uruguay	1981	10	-21.96	2	2.16
Venezuela	1980	7	-13.40	1	0.07

All 33 episodes refer to systemic sudden stops that are followed by an output recovery that does not rely on regaining access to foreign capital markets, termed "Phoenix Miracles". The identification of these periods follows the definition of Calvo et al. (2006).

Table 4: General. negative binomial model, dependent variable is duration

Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)[1)]	(8)[1)]
Past FDI/GDP	-.0211	-.2557*	-.1939*	-.1456**			-.204	-.2341
	(-.42)	(-1.87)	(-1.68)	(-2.04)			(-1.25)	(-1.57)
Creditor Rights	-.1526	-.3205**	-.3391***	-.3338***	-.3799***	-.3141**	-.3659***	-.3693***
	(-1.33)	(-2.41)	(-4.46)	(-7.19)	(-2.81)	(-2.47)	(-3.47)	(-4.02)
Past FDI∗CR		.1186**	.1166***	.0831***			.1163	.1595**
		(2.26)	(3.10)	(3.44)			(1.33)	(2.15)
Drop real GDP			-.0357***	-.0398***		-.0258***		-.0359***
			(-6.75)	(-3.92)		(-3.75)		(-6.72)
Real GDP				-.0001***				
				(-3.81)				
Investment/GDP				-.0032				
				(-.24)				
Trade/GDP				.001				
				(.43)				
Terms of trade				-.0008				
				(-.73)				
Past trade/GDP					-.0051*	-.0026		
					(-1.84)	(-.86)		
Past Trade∗CR					.0021	.0016		
					(1.21)	(1.07)		
Reg./Time dummies	no	no	yes	yes	yes	yes	yes	yes
Observations	33	33	33	33	33	33	31	31

1) Past FDI captures the averages over the last ten years instead of five.

Always include a constant and heteroscedasticity robust s.e., which are clustered each year to allow for a yearly correlation of macro shocks across countries. t-statistics in parenthesis. ***,**,* significant at 1%, 5%, 10%. We include a time dummy for the 1980s and three regional dummies for Latin America, Asia, and Africa.

Table 5: General. negative binomial model, dependent variable is duration

$CR \in \{0;1;2\}$ vs. $CR \in \{3;4\}$		Effects by each CR	
Drop real GDP	-.0441***	Drop real GDP	-.0582***
	(-4.79)		(-4.39)
Creditor Rights	-.3125***	CR1	-.3890**
	(-4.27)		(-2.26)
Past FDI∗CRgood	-.0017	CR2	-1.10***
	(-.08)		(-3.97)
Past FDI∗CRbad	.3778***	CR3	-1.24***
	(7.37)		(-15.21)
		CR4	-1.12***
			(-7.85)
		Past FDI	-.1766*
			(-1.92)
		Past FDI∗CR1	.1202*
			(1.73)
		Past FDI∗CR2	.2595*
			(1.82)
		Past FDI∗CR3	.3784***
			(3.27)
		Past FDI∗CR4	.4798***
			(4.71)
Time dummies	yes		yes
Observations	33		33

Good creditor rights protection *CRgood*: $CR \in \{0;1;2\}$; bad creditor rights protection *CRbad*: $CR \in \{3;4\}$.

Always include heteroscedasticity robust s.e. which are clustered each year. t-statistics in parenthesis. ***,**,* significant at 1%, 5%, 10%.

References

Acharya, V. V., Y. Amihud, and L. Litov: 2009, 'Creditor Rights and Corporate Risk-taking'. Working Paper 15569, NBER.

Ahlin, C. and N. Jiang: 2008, 'Can Micro-Credit Bring Development?'. *Journal of Development Economics* (86), 1–21.

Aitken, B. J. and A. E. Harrison: 1999, 'Do Domestic Firms Benefit from Direct Foreign Investment? Evidence from Venezuela'. *American Economic Review* **89**(3), 605–618.

Aitken, B. J., A. E. Harrison, and R. E. Lipsey: 1996, 'Wages and Foreign Ownership: A Comparative study of Mexico, Venezuela, and the United States'. *Journal of International Economics* **42**, 345–371.

Alfaro, L., A. Chanda, S. Kalemli-Ozcan, and S. Sayek: 2004, 'FDI and Economic Growth: The Role of Local Financial Markets'. *Journal of International Economics* **64**(2), 89–112.

Balcão Reis, A.: 2001, 'Welfare Effects of Foreign Investment'. *Journal of International Economics* **54**, 411–427.

Banerjee, A. V. and A. F. Newman: 1993, 'Occupational Choice and the Process of Development'. *Journal of Political Economy* **101**(2), 274–298.

Basu, P. and A. Guariglia: 2007, 'Foreign Direct Investment, Inequality, and Growth'. *Journal of Macroeconomics* **29**, 824–839.

Borensztein, E., J. De Gregorio, and J.-W. Lee: 1998, 'How Does Foreign Direct Investment Affect Economic Growth?'. *Journal of International Economics* **45**(1), 115–135.

Calvo, G. A., A. Izquierdo, and E. Talvi: 2006, 'Sudden Stops and Phoenix Miracles in Emerging Markets'. *American Economic Review* **2**, 405–410.

Choi, C.: 2006, 'Does Foreign Direct Investment Affect Domestic Income Inequality?'. *Applied Economics Letters* **13**, 811–814.

De Backer, K. and L. Sleuwaegen: 2003, 'Does Foreign Direct Investment Crowd Out Domestic Entrepreneurship?'. *Review of Industrial Organization* **22**(1), 67–84.

De Mello, L. R.: 1997, 'Foreign Direct Investment in Developing Countries: A Selective Survey'. *Journal of Development Studies* **34**, 1–34.

Djankov, S., C. McLiesh, and A. Shleifer: 2007, 'Private Credit in 129 Countries'. *Journal of Financial Economics* **84**(2), 299–329.

Eichengreen, B. and D. Leblang: 2003, 'Capital Account Liberalization and Growth: Was Mr. Mahathir Right?'. *International Journal of Finance and Economics* **8**(3), 2005–224.

Feenstra, R. C. and G. H. Hanson: 1997, 'Foreign Direct Investment and Relative Wages: Evidence from Mexico's Maquiladoras'. *Journal of International Economics* **42**, 371–393.

Findlay, R.: 1978, 'Relative Backwardness, Direct Foreign Investment, and the Transfer of Technology: A Simple Dynamic Model'. *Quarterly Journal of Economics* **92**(1), 1–16.

Fosfuri, A., M. Motta, and T. Rønde: 2001, 'Foreign Direct Investment and Spillovers Through Workers' Mobility'. *Journal of International Economics* **53**(1), 205–222.

Gall, T.: 2008a, 'Inequality, Incomplete Contracts, and the Size Distribution of Business Firms'. *International Economic Review (forthcoming)*.

Gall, T.: 2008b, 'Lotteries, Inequality, and Market Imperfection: Galor and Zeira Go Gambling'. *Economic Theory* **34**(2), 359–382.

Galor, O. and J. Zeira: 1993, 'Income Distribution and Macroeconomics'. *Review of Economic Studies* **60**, 35–52.

Ghatak, M., M. Morelli, and T. Sjöström: 2001, 'Occupational Choice and Dynamic Incentives'. *Review of Economic Studies* **68**, 781–810.

Görg, H. and D. Greenaway: 2004, 'Much Ado About Nothing? Do Domestic Firms Really Benefit from Foreign Direct Investment?'. *World Bank Research Observer* **19**(2), 171–197.

Grossman, G. M.: 1984, 'International Trade, Foreign Investment, and the Formation of the Entrepreneurial Class'. *American Economic Review* **74**(4), 605–614.

Hermes, N. and R. Lensink: 2003, 'Foreign Direct Investment, Financial Development and Economic Growth'. *Journal of Development Studies* **40**(1), 142–163.

Heston, A., R. Summers, and B. Aten: 2006, 'Penn World Table Version 6.2'. *Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania*.

Javorcik, B. S.: 2004, 'Does Foreign Direct Investment Increase the Productivity of Domestic Firms? In Search of Spillovers through Backward Linkages'. *American Economic Review* **94**(3), 605–627.

Li, J. and S. Guisinger: 1991, 'Comparative Business Failures of Foreign-Controlled Firms in the United States'. *Journal of International Business Studies* **22**(2), 209–224.

Lipsey, R. E. and F. Sjöholm: 2004, 'Foreign Direct Investment, Education and Wages in Indonesian Manufacturing'. *Journal of Development Economics* **73**, 415–422.

Lucas, R. E.: 1990, 'Why Doesn't Capital Flow from Rich to Poor Countries?'. *American Economic Review* **80**(2), 92–96.

Markusen, J. R. and A. J. Venables: 1999, 'Foreign Direct Investment as a Catalyst for Industrial Development'. *European Economic Review* **43**(2), 335–356.

Mata, J. and P. Portugal: 2004, 'Patterns of Entry, Post-entry Growth, and Survival'. *Small Business Economics* **22**, 283–298.

Matsuyama, K.: 2004, 'Financial Globalization, Symmetry Breaking and Endogenous Inequality of Nations'. *Econometrica* **72**(3), 853–884.

Mayer-Foulkes, D. and P. Nunnenkamp: 2005, 'Do Multinational Enterprises Contribute to Convergence or Divergence? A Disaggregated Analysis of US FDI'. *Kiel Working Papers* **1242**.

Tsai, P.-L.: 1995, 'Foreign Direct Investment and Income Inequality: Further Evidence'. *World Development* **23**, 469–483.

UNCTAD: 2007, *World Investment Report 2007*. United Nations Publications, Geneva.

Young, A.: 1991, 'Learning by Doing and the Dynamic Effects of International Trade'. *Quarterly Journal of Economics* **106**(2), 369–406.