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Department of Economics
University of Munich

Volkswirtschaftliche Fakultät
Ludwig-Maximilians-Universität München

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When is FDI a Capital Flow?

Dalia Marin* and Monika Schnitzer**

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Abstract
In this paper we analyze the conditions under which a foreign direct investment (FDI) involves a net capital flow across countries. Frequently, foreign direct investment is financed in the host country without an international capital movement. We develop a model in which the optimal choice of financing an international investment trades off the relative costs and benefits associated with the allocation and effectiveness of control rights resulting from the financing decision. We find that the financing choice is driven by managerial incentive problems and that FDI involves an international capital flow when these problems are not too large. Our results are consistent with data from a survey on German and Austrian investments in Eastern Europe.

Keywords: Multinational firms, Firm specific capital costs, Internal capital markets, International capital flows

JEL: F23, F21, G32, L20, D23

* University of Munich, Department of Economics, Ludwigstr. 28 Vgb, D-80539 Munich, Germany, and Centre for Economic Policy Research. Phone: +49 89 2180 2446, Fax: +49 89 2180 6227, e-mail: Dalia.Marin@lrz.uni-muenchen.de

** Corresponding author: University of Munich, Department of Economics, Akademiestr. 1/III, D-80799 Munich, Germany, and Centre for Economic Policy Research. Phone: +49 89 2180 2217, Fax: +49 89 2180 2767, e-mail: schnitzer@lrz.uni-muenchen.de

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1 Introduction

Attracting foreign direct investments(FDI) is a prime objective for policymakers all over the world, most notably in developing and transition countries. They expect that FDI brings additional capital to their countries. However, as Feldstein and Horioka (1980) have pointed out, this is not necessarily true. Frequently, FDI is financed in the host country, in which case there is no net movement of capital. Indeed, for some time economists have been puzzled by the question that Lucas (1990) raised so pointedly, i.e. why there is so little capital flowing from rich to poor countries.

In this paper we investigate when FDI leads to an international capital flow. We ask in particular under which conditions a net capital flow is induced and how this is related to the underlying motivation of the investment. The literature on multinational firms has not explicitly addressed this question so far. There are two main approaches to explaining FDI, one taking a macroeconomic, the other one taking a microeconomic perspective.[1] The early literature interpreted FDI as one particular form of capital flow that is driven by differences in international capital cost. This macroeconomic view of FDI as an international capital flow was challenged already by economists like Kindleberger (1969), noting that FDI is often enough financed locally. And as Hymer (1960) argued in his dissertation, this capital flow view is not consistent with the observation that foreign direct investment often flows two ways and often enough between countries with very similar interest rates.[2]

The modern microeconomic theories of multinational activities follow a more eclectic approach, incorporating elements of industrial organization, new trade

[1] Lipsey (2001).

[2] Despite these problems, most empirical studies on FDI follow the capital flow approach that is driven by macroeconomic country characteristics. For a recent study in this vein see Albuerquerque et al. (2003) who attempt to explain the dynamics of FDI flows in response to increased integration of capital markets. They distinguish global and local (country specific) factors and show that global factors have increased in importance over time.

theory and transaction cost economics. The multinational investment is carried out by an investor with some idea, technology or management skills that could be successfully employed in some other country. The reason why the investor opts for production abroad instead of exporting is motivated by trade arguments like transport costs and tariff barriers. Similarly, the reason why the multinational prefers to produce goods in house rather than granting a license to a foreign producer, is explained by arguments drawing on transaction costs.

A short way of putting it would be to say that the modern theory of multinationals equates FDI with a technology transfer rather than a capital flow. How this investment is financed, and to what extent a capital flow is induced, is not addressed by this literature.

In this paper we attempt to establish a link between these two approaches towards FDI. We take the microeconomic motivation for FDI as given and ask how the considerations that drive FDI in the first place affect the decision how to finance the investment. More pointedly, we are asking how does the technology transfer affect the capital flow? Looking at FDI through the microeconomic lense, we are able to develop a theory of FDI where capital cost considerations play a role, but where capital cost are firm or project specific, rather than country specific.

For this purpose, we set up a contract theoretical model with managerial incentive problems. In this model, the multinational investor has to choose how to finance this investment, locally or globally. We find that the financing structure can be used to govern the incentives of the manager.

We derive a number of predictions how this should affect the decision how to finance the investment. These predictions are then confronted with our survey data on German and Austrian international investment projects. We find that projects are financed locally if the incentive problems are rather large. If instead the incentive problems are moderate, global financing is preferred, leading to a capital flow to the host country.

To assess whether or not FDI consists of a capital flow from Germany or Austria to Eastern Europe the share of FDI that is locally financed in Eastern Europe and

that comes from external sources matters. Table 1 reports on the findings from our survey data.[3] We find that in Germany 27 percent and in Austria 47.9 percent of total investment are at least partly financed by external sources (external and mixed financing). 30 to 40 percent of all external and mixed funding are coming from local sources either through a loan by a local bank in the host country or by equity raised in the host country (not shown). Thus, in roughly 15 percent of the cases an FDI investment to Eastern Europe does not involve a capital flow. These figures do not take into account reinvested profits by affiliates in the host country which count as FDI and do not involve a capital transfer from the home to the host country.

Table 1: Financing of FDI in Eastern Europe by Parent Firms
(in percent of total FDI)

type of finance	Germany	Austria
external	8.43	11.85
internal	67.54	49.52
mixed (external and internal)	18.63	36.07
missing	5.40	2.56

Source: Chair of International Economics, University of Munich,
firm survey of 660 German and Austrian firms

This paper is related to three strands of literature. Harrison and McMillan (2002) provide an empirical study about the impact of foreign direct investment on domestic firms' credit constraint. Using firm-level data from the Ivory Coast they find that if foreign firms borrow from domestic banks, as they often do, they may crowd local firms out of domestic capital markets. The net inflow of capital

[3]See Marin (2004) for a more detailed description of the data set and Marin et al (2003) for evidence on the relative importance of capital flows and technology transfers to Eastern Europe.

in the sense of what is left for domestic firms may be even negative. This negative effect has to be weighted of course against benefits from technology transfers, tax revenues and wages that accrue to local workers. Harrison, Love and McMillan (2003) address the same question, using cross-country firm-level data from around 50 countries. In this study they find that FDI reduces the financing constraints of local firms, but more so for foreign owned firms than for domestically owned firms.

Our paper is also related to the rather small literature on the financing of multionational firms. The most prominent explanations offered by this literature are based on international tax differences (see e.g. Chowdhry and Coval (1998), Chowdhry and Nanda (1994)). Desai, Foley and Hines (2004) provide an empirical analysis of the capital structure of foreign affiliates of multinational enterprises. They find that affiliates rely more on internal financing from parents than on external financing if they are located in countries with underdeveloped credit markets and weak creditor protection. Hooper (2002) provides evidence from survey data on UK and US based multinationals and show that companies investing in countries with high political risk have a greater preference for local sources of financing than international sources of financing.

Finally, for our model we draw on insights from the corporate finance literature and its incentive based explanations of capital structure. A first model of foreign direct investment based on a capital cost approach is Froot and Stein (1991). Closest in spirit to our paper is the paper by Gertner, Scharfstein and Stein (1994) that compares the costs and benefits of relying on internal capital versus external bank lending. In this model the disadvantage of internal financing is that the owner monitors more than a bank and that this reduces the manager's entrepreneurial incentives. Gertner et al. see the advantage of internal financing in that internal capital makes it easier to efficiently redeploy the assets that perform poorly. We follow their idea that managers do not like to be too closely controlled, but find that controlling more is preferable for the investor if the manager's incentives are not too important. Another related paper on the optimal capital structure of

firms is Aghion and Bolton (1992). This paper captures the idea of debt as an asset transfer mechanism in case of underperformance. As we will see the threat of losing control over the investment project in case the credit is not repaid has a disciplining role in our model as well. We have explored the implications of managerial incentive problems for the organization of international capital and technology flows in the context of barter and countertrade in Marin and Schnitzer (1995) and (2002).[4].

The paper is organized as follows. In section 2 we develop the contract theoretical model. Sections 3 and 4 study the properties of the model under internal financing and bank financing, respectively. In section 5 we compare these properties, derive the optimal financial structure and determine the forces that are responsible for international capital flows. Section 6 introduces our data set, derives empirical predictions from our model and confronts these predictions with the data. Section 7 concludes.

2 The model

Consider a multinational investor (she) with an idea for a potentially profitable investment project. To run the project the investor has to hire a manager (he). The project generates returns for up to two periods. In period 1 the project yields a return of R with probability p and of 0 with probability (1-p). In period 2 the project yields a return of Z.

The manager has two decisions to take. First of all, he chooses the probability of the project's success in period 1. To implement a particular $p > 0$, he incurs a non-pecuniary effort cost of $C(p)$, with $C'(0) = 0$ and $C'(1) = \infty$. The problem is that this effort level is not verifiable, so the manager's incentive to spend effort on implementing a particular p cannot be governed by a contract contingent on p.

The second decision the manager has to take is about how much of the project's returns to reveal and return to the investor. The problem here is that the returns

[4]For another paper in this spirit see Habib and Johnson (1999)

are not verifiable. This means the manager can claim not to have realized any returns and keep everything to himself, if he wishes to do so.

Thus, the investor, when hiring a manager, has to solve two kinds of managerial incentive problems. The first one is to make the manager choose effort to increase the probability of success of the project. We will call this the **effort problem**, since the issue is to induce the manager to spend effort and to increase the expected returns. The second incentive problem is to make the manager hand over the returns of the project. We will call the second problem the **repayment problem** since the issue is to make the manager hand over the returns to the investor. So the first problem is about increasing the size of the pie to be shared and the second problem is about capturing a large share of the pie.

At the time the manager is hired, no contract can be written that would induce the manager to take the desired actions. Instead, the multinational investor has to govern the manager's behavior by exercising two different control rights.

First of all, she has access to a monitoring technology that allows her to capture a share β of the returns in period 1. The cost of implementing this technology is a function of both β and δ, the distance between headquarters and the location of the investment. The idea is that the larger the distance between headquarters and project, the more difficult and hence the more costly it is to monitor the manager. This is reflected by the following properties of the cost function $M(\beta, \delta)$.

$$\frac{dM}{d\beta} > 0, \frac{d^2M}{d\beta^2} > 0, \frac{dM}{d\delta} > 0, \frac{d^2M}{d\beta d\delta} > 0. \tag{1}$$

A second control right stems from the fact that as the owner of the firm, the investor has the right to liquidate the firm. If she does so after period 1, she realizes a liquidation value of L. She can use this threat of liquidation when she negotiates with the manager about how to share the returns of period 1. Without loss of generality we assume that the negotiation between investor and manager is carried out as a Nash bargaining game, where each of the two sides gets his or her outside option if the negotiation breaks down and the project is liquidated and

both share the net surplus of continuation whereby the investor receives a share α and the manager a share of $1-\alpha$.

Before starting the project, the multinational investor has to decide on how to finance the project. The investor can choose between financing the investment internally, through funds from the headquarters, or externally, with a bank credit. In the latter case the bank credit can be taken locally, from a bank in the host country, or globally, from a multinational bank in the home country. Thus, there are two forms of global financing, internally or through a bank credit from a multinational bank, and one form of local financing, through a local bank.

The financing decision has an impact on the **allocation of the right to liquidate** the firm. If the project is financed with internal funds, the investor has the right to exercise her right to liquidate the firm as she pleases. If, however, a bank has granted a credit, only the bank has the right to liquidate the firm, conditional on the credit not being repaid. In this case the bank realizes a liquidation value of L_B. However, if the credit is paid back in due time, the bank has no right to interfere.

The size of the liquidation value depends on who liquidates the project and where he or she is located with respect to the project. It seems natural to assume that the investor achieves a higher liquidation value than a bank, since she has better information on what to do with the assets. Similarly, a commonly made assumption is that a local bank realizes a higher liquidation value than a global bank because of the locational advantage.[5] Let $\overline{L}_B$ and $\underline{L}_B$ denote the liquidation value in case of liquidation by a local bank or a global bank, respectively. Then, our assumptions imply that

$$\underline{L}_B < L \quad \text{and} \quad \underline{L}_B < \overline{L}_B \tag{2}$$

A priori, it is not clear whether $\overline{L}_B < L$ or $\overline{L}_B > L$, i.e. whether the investor or a local bank can realize a higher liquidation value. However, for the

[5]See e.g. Hermalin and Rose (1999) or Ferraris and Minetti (2005).

host countries we have in mind it seems most plausible to assume that

$$\overline{L}_B < L \ . \tag{3}$$

This assumption captures the notion that the location advantage experienced by the local bank is smaller than the owner's advantage of being specialized in the business.

Throughout the paper we will assume that the investor has no financial constraints at the time of the investment, i.e. she can choose freely between internal and external finance, guided only by effort and repayment considerations. Once the investment has been taken, however, the project has to be self-financing, i.e. the credit cannot be secured by other funds the investor might have had access to in the beginning. This assumption reflects the common practice of foreign companies to limit their loan exposure to the local subsidiary.[6]

The time structure of the game is as follows. First the investor decides about the financing of the investment and hires a manager. Then, both the manager chooses probability p of high return in period 1 and the investor implements her monitoring technology. Returns of period 1 are realized and the investor and manager negotiate about how to share the returns. If the project has been financed with internal funds, the investor can liquidate the firm if she is not happy with the outcome of the negotiation.

In case of bank finance, the investor has to repay the credit, otherwise the bank liquidates the firm. If the firm is not liquidated at the end of period 1, return Z is realized in period 2.

The time structure is summarized in figure 1.

[6]See Harrison et al. (2003). Theoretically, the idea is that whatever funds the investor might initially have had a her disposal are used for other purposes throughout the game and hence are no longer available.

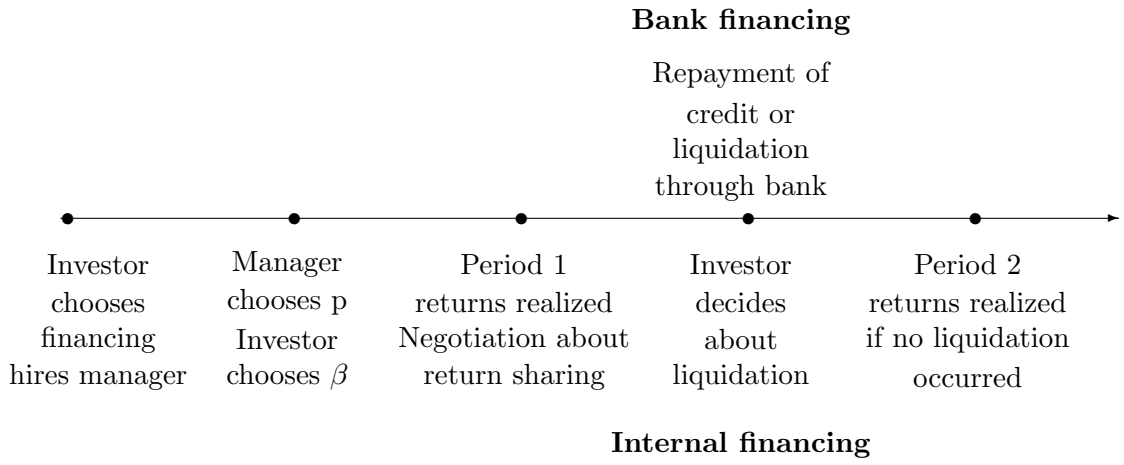

Figure 1

3 Financing through headquarters

In this section we analyze the manager's decision to invest in effort and the investor's decision to monitor the manager if the firm is financed with funds from the headquarters. To solve the model we proceed by backward induction.

Consider period 2. If the project has not been liquidated before, it generates a return of Z. However, as this return is not verifiable, the investor cannot force the manager to hand over this return. Since this is the end of the project, the manager has nothing to lose and thus keeps all of Z to himself.

Consider now period 1. If the project has generated a return of 0, the manager cannot hand over any returns to the investor even if he wishes to. Hence, the only possibility for the investor to receive any positive payoff is to liquidate the firm. In this case, the investor's payoff is $L - M(\beta, \delta)$ and the manager's payoff is $-C(p)$.

Suppose next that the manager has realized a return of R. Investor and manager negotiate about how to share this return. If the negotiation fails, the investor realizes a payoff of $\beta R + L - M(\beta, \delta)$, from exercising her rights to monitor and to liquidate. It would be efficient to continue operation in order to realize returns

Z instead of liquidating the firm, i.e. the net surplus of continuing is positive, $Z - L > 0$. As we have assumed above, both sides share the net surplus of continuation such that the investor receives a share α and the manager a share of $1 - \alpha$. Thus, if return R is realized, there will be efficient renegotiation such that the investor's payoff is $\beta R + L + \alpha(Z - L) - M(\beta, d)$ and the manager's payoff is $(1 - \beta)R + (1 - \alpha)(Z - L) - C(p)$.[7]

From an ex ante point of view, the investor's expected payoff is hence

$$p[\beta R + L + \alpha(Z - L)] + (1 - p)L - M(\beta, d). \tag{4}$$

and the manager's expected payoff is

$$p[(1 - \beta)R + (1 - \alpha)(Z - L)] - C(p). \tag{5}$$

Consider now the manager's decision to choose the probability of success, p, and the investor's decision to implement a monitoring technology that determines β, the share of returns the investor can appropriate through monitoring. Both decisions are taken simultaneously.

The manager's optimal effort choice, as a response to the investor's control rights, is described by the following Lemma.

Lemma 1 *The more effective the investor's control rights, i.e. the right to liquidate the firm, as captured by L, and the right to monitor the manager, as captured by β, the smaller is the effort chosen by the manager in equilibrium.*

Proof: See Appendix.

Note that the larger β and the larger L, the more of the payoff can be appropriated by the investor, either directly or indirectly, by improving her outside option and hence improving her bargaining position in the negotiation with the

[7]The implicit assumption for these payoffs to be correct is $\beta R + L + \alpha(Z - L) \leq R$, since otherwise the liquidity constrained manager has not sufficient funds to pay the required amount that satisfies the bargaining condition.

manager. This leaves less payoff for the manager and hence less motivation for him to spend effort on p.

Consider next the investor's decision to implement a monitoring technology β. The investor chooses β to maximize her expected payoff

$$p[\beta R + L + \alpha(Z - L)] + (1 - p)L - M(\beta, d). \tag{6}$$

Lemma 2 *The larger the manager's effort choice p and the smaller the distance δ, the larger the monitoring technology β chosen by the investor.*

Proof: See Appendix.

In equilibrium, manager and investor choose p^* and β^* such that both are best responses against each other. The following Lemma describes how these equilibrium decisions (p^*, β^*) are affected by changes in L, the investor's liquidation value, and by δ, the distance between headquarters and investment project.

Lemma 3 *The equilibrium values p^* and β^* have the following properties.*

- *The larger L, the liquidation value of the firm, the smaller are both p^* and β^*.*
- *The larger δ, the distance between headquarters and investment location, the larger p^* and the smaller β^*.*

Proof: See Appendix.

4 Bank financing

Instead of financing the investment project with headquarters' funds the investor can choose to take a bank credit. Note that this credit is taken for strategic reasons, not because of liquidity constraints. The investor asks for a credit of size K and promises a repayment of $D \geq K$. The banking sector is assumed to be perfectly competitive. This means repayment D is chosen such that the expected repayment guarantees an expected profit of zero to the bank.

$$pD + (1-p)\min(D, L_B) = K \ . \tag{7}$$

Involving a bank affects the bargaining between manager and investor about how to share the returns. If the two do not reach an agreement and the credit is not repaid it is no longer the investor but the bank that liquidates the firm. How exactly this affects the negotiation between manager and investor depends on whether the credit is small or large. Credits are called small if the liquidation value suffices to cover the necessary repayment, i.e. $K \leq L_B$. Credits are called large if the credit size exceeds the liquidation value, i.e. $K > L_B$.

Small credit

Suppose the investor takes a small credit, i.e. $K \leq L_B$. In this case, the liquidation value suffices to cover the credit sum, so the zero profit condition (7) boils down to $D = K$. The investor first receives credit sum K, then repays D, either from her share of the returns or, if the firm is liquidated, from the liquidation value L_B. Any liquidation returns in excess of D, $L_B - D$, accrue to the investor.

For the investor, such a small credit has the following payoff effects. If returns are zero, a lower liquidation value is realized, leading to a dead weight loss that is fully borne by the investor. Furthermore, if returns are positive, her outside option in case negotiations with the manager break down is now L_B instead of L. This implies that her payoff in the bargaining becomes smaller and that of the manager becomes larger. The expected payoff of the investor in case of a small bank credit is hence

$$\begin{aligned} & p[\beta R + (L_B - D) + \alpha(Z - L_B)] + (1-p)(L_B - D) + K - M(\beta, \delta) & (8) \\ = \ & p[\beta R + L_B + \alpha(Z - L_B)] + (1-p)L_B - M(\beta, \delta). & (9) \end{aligned}$$

using that $D = K$.

For the manager the expected payoff is

$$p[(1-\beta)R + (1-\alpha)(Z - L_B)] - C(p). \tag{10}$$

Total payoffs are

$$p[R+Z]+(1-p)L_B-C(p)-M(\beta,d) \tag{11}$$

Comparing the payoffs for both investor and manager in case of a small bank credit and in case of internal financing, we find that for any given p they differ only with respect to the liquidation value. But from Lemma 3 we know that a change in liquidation value affects the equilibrium values p^* and β^*, i.e. $p^*(L_B) \equiv \overline{p} > p \equiv p^*(L)$, and similarly $\beta^*(L_B) \equiv \overline{\beta} > \beta \equiv \beta^*(L)$.

The investor's equilibrium payoff in case of a small bank credit is thus

$$\overline{p}[\overline{\beta}R+L_B+\alpha(Z-L_B)]+(1-\overline{p})L_B-M(\overline{\beta},\delta) \tag{12}$$

Comparing this payoff to her payoff in case of internal financing we find that the investor has a higher payoff in case of a small bank credit if and only if

$$\underbrace{(\overline{p}-p)[\alpha(Z-L_B)]+[(\overline{p}\overline{\beta}R-M(\overline{\beta},\delta))-(p\beta R-M(\beta,\delta))]}_{\text{effort effect}} \tag{13}$$

$$-\underbrace{p(1-\alpha)(L-L_B)}_{\text{repayment effect}}-\underbrace{(1-p)(L-L_B)}_{\text{capital cost effect}} \geq 0 \tag{14}$$

The positive effort effect captures the fact that a lower liquidation value makes the manager choose a larger p which in equilibrium results in a larger β as well. The negative repayment effect captures that the investor receives a smaller share of the first period's returns, due to her lower outside option. Finally, the negative capital cost effect reflects the dead weight loss that results from the fact that when the firm generates no returns it will be liquidated at a lower value.

The following Lemma summarizes the different effects of a small bank credit.

Lemma 4 Small bank credit

Compared to financing through headquarters, a small credit

- *reduces the effort problem*
- *increases the repayment problem*
- *increases the capital cost due to the lower liquidation value.*

Taking up a small bank credit can be seen as a commitment device of the investor to refrain from appropriating too large a share of the returns in the process of negotiating with the manager, in order to make the manager choose a higher effort. This commitment, however, comes at a cost, since the capital cost in case of a local bank credit are higher. This is reflected by the lower liquidation value that is realized if the returns turn out to be zero. Hence, the positive effort effect has to compensate not only the negative repayment effect but also the negative capital cost effect.

Large credit

Consider now the case of a large bank credit, i.e. $K > L_B$. In contrast to a small bank credit, the full repayment of a large credit is not possible if the firm is liquidated. D has to be chosen such that the zero profit condition for the bank is fulfilled. The bank realizes an expected payoff of zero, for any expected value of p, $\hat{p}$, if

$$\hat{p}D + (1-\hat{p})L_B = K \tag{15}$$

$$D = \frac{1}{\hat{p}}[K - (1-\hat{p})L_B] \tag{16}$$

How does a large credit affect the negotiation between manager and investor? The outside option of not coming to an agreement is now $\beta R - M(\beta, \delta)$ for the investor, since all of the liquidation value goes to the bank if the credit is not repaid. The surplus from continuation is now $(Z - D)$ because the project can be continued only if the credit is repaid in full. Thus, the investor's expected payoff is

$$K + p[\beta R + \alpha(Z - D)] + (1 - p)0 - M(\beta, \delta) \tag{17}$$
$$= p[\beta R + D + \alpha(Z - D)] + (1 - p)L_B - M(\beta, \delta) \tag{18}$$

using (16) and the fact that in equilibrium $p = \hat{p}$. The manager's expected payoff is

$$p[(1 - \beta)R + (1 - \alpha)(Z - D)] - C(p) \tag{19}$$

Total payoffs are

$$p[R + Z] + (1 - p)L_B - C(p) - M(\beta, d) \tag{20}$$

Note that this time it is the manager who has to suffer a payoff loss. The reason is that the larger the credit to repay, the less profitable it becomes to continue the project, and hence the smaller the manager's payoff from bargaining with the investor. This has a negative effect on his incentive to spend effort on probability p.

In the Appendix we show that in this case equilibrium values p^* and β^* will be lower than in case of internal financing, provided $D > L$, i.e. $p^*(D) \equiv \underline{p} < p \equiv p^*(L)$, and similarly $\beta^*(D) \equiv \underline{\beta} < \beta \equiv \beta^*(L)$. So the investor's equilibrium payoff in case of a large credit is

$$\underline{p}[\underline{\beta}R + D + \alpha(Z - D)] + (1 - \underline{p})L_B - M(\underline{\beta}, \delta) \tag{21}$$

Comparing this payoff to her payoff in case of internal financing we find that she enjoys a higher payoff in case of a large bank credit if and only if

$$\underbrace{-(p - \underline{p})[\alpha(Z - D) + (1 - \alpha)(D - L_B)] - [(p\beta R - M(\beta, d)) - (\underline{p}\underline{\beta}R - M(\underline{\beta}, d))]}_{\text{effort effect}} \tag{22}$$
$$+ \underbrace{\underline{p}(1 - \alpha)(D - L)}_{\text{repayment effect}} - \underbrace{(1 - p)(L - L_B)}_{\text{capital cost effect}} \geq 0$$

The investor gains what the manager loses, but at the same time she loses from the lower liquidation value that results again in a dead weight loss whenever returns are zero. The following lemma summarizes these different effects.

Lemma 5 Large bank credit
A large credit

- *reduces the repayment problem*
- *increases the effort problem*
- *increases the capital cost due to the lower liquidation value.*

Thus, we find that small and large credits affect payoffs and incentives of investor and manager in very different ways. A small credit can be used to reduce the effort problem, whereas a large credit can be used to reduce the repayment problem. However, both kinds of credits cause a dead weight loss due to higher capital costs.

5 Optimal financing choice

How should the investor finance the project if she is free to choose, i.e. if she does not face any financial constraints?

The first result summarizes the different effects that are driving the choice of small or large bank credits, as opposed to internal financing.

Result 1 Credit versus Internal Financing

- *A small credit is chosen instead of internal financing if the positive effort effect outweighs the negative repayment and capital cost effects.*
- *A large credit is chosen instead of internal financing if the positive repayment effect outweighs the negative effort and capital cost effects.*

Consider next how a change in distance affects the relative choice of financing. This is described in the following result:

Result 2 Impact of Distance
The larger the distance δ,

- *the smaller the effort effect,*
- *the larger the repayment effect*
- *and the smaller the capital cost effect of small and large bank credits.*

Proof: See Appendix

To get an intuition for this consider again the investor's payoff difference in case of a large credit as compared to internal financing. In the following inequality we indicate how the different effects are affected by an increase in distance. A $(-)$ or $(+)$ sign indicates that this term gets smaller or larger as distance increases.

$$\underbrace{-\overbrace{(p-\underline{p})}^{(-)}[\alpha(Z-D)+(1-\alpha)(D-L_B)]-\overbrace{[(p\beta R-M(\beta,d))-(\underline{p}\underline{\beta}R-M(\underline{\beta},d))]}^{(-)}}_{\text{effort effect}} \tag{23}$$
$$+\underbrace{\overbrace{p}^{(+)}(1-\alpha)(D-L)}_{\text{repayment effect}}-\underbrace{\overbrace{(1-p)}^{(-)}(L-L_B)}_{\text{capital cost effect}} \geq 0$$

So the negative effects get smaller and the positive effect gets larger as the distance gets larger. This is due to the concavity of the manager's effort cost function. The larger the distance, the less monitoring occurs and hence the more the manager spends effort for any given liquidation value. This increases the marginal cost of additional effort and hence reduces the effort effect of a bank credit.

In case of a small bank credit the relative changes are indicated in the following payoff difference

$$\underbrace{\overbrace{(\overline{p}-p)}^{(-)}[\alpha(Z-L_B)]+\overbrace{[(\overline{p}\overline{\beta}R-M(\overline{\beta},d))-(p\beta R-M(\beta,d))]}^{(-)}}_{\text{effort effect}} \tag{24}$$
$$-\underbrace{\overbrace{p}^{(+)}(1-\alpha)(L-L_B)}_{\text{repayment effect}}-\underbrace{\overbrace{(1-p)}^{(-)}(L-L_B)}_{\text{capital cost effect}} \geq 0$$

As we see, in case of a small credit, the positive effort effect is reduced and the negative repayment effect is increased, thus both reduce the left hand side of the inequality. The negative capital cost is reduced, however. So the overall effect is not unambiguous. But as the capital cost effect is the same for small as well as for large credits, the attractiveness of small credits as opposed to large credits is unambiguously reduced. Furthermore, for low values of α, the attractiveness of small credits as opposed to internal financing is unambiguously reduced as well.

Finally, we consider the optimal choice of taking a credit from a local versus a global bank, if a credit is to be taken at all. Suppose the investor wants to take a large credit. In this case the repayment effect results from choosing the appropriate D. The liquidation value matters only for the determination of the capital cost. So, whatever repayment effect is desired should be chosen at the lowest possible dead weight loss, i.e. at the highest possible liquidation value. This makes it optimal to choose the local bank.

Suppose instead the investor wants to chooses a small credit. Now she faces a tradeoff. Choosing a global bank implies a smaller the liquidation value and hence a larger positive effort effect. But at the same time, this leads to a larger negative repayment and capital cost effect. Choosing a local bank with a larger liquidation value means a smaller positive effort effect, but also a smaller negative repayment and capital cost effect. Depending which of the two countervailing forces dominates, the investor will choose a small credit from a local or from a global bank. This reasoning is summarized in the following result.

Result 3 Local versus Global Bank

- *Suppose the investor chooses a large credit to benefit from the positive repayment effect. Then it is optimal to choose a local bank.*
- *Suppose instead the investor chooses a small credit to benefit from the positive effort effect. Then the optimal choice between a local and a global bank depends on the relative sizes of the positive effort effect and the negative repayment and capital cost effects.*

6 Empirical predictions and data

In this section we derive a number of empirical predictions from the results established before and confront them with survey data.

The Data

The data consists of new survey data of 660 German and Austrian firms with 2200 investment projects in transition countries during the period 1900 to 2001. In terms of value the 1200 German investment projects represent 80 percent of total investment in Eastern Europe in this period, while the 1000 Austrian investment projects represent 100 percent of total Austrian investment to Eastern Europe. The questionnaire of the survey comes in three parts: information on parent firms in Austria and Germany, information on the actual investment, and information on Eastern European affiliates and their environment. Due to the length of the questionnaire we personally visited the parent firms in Austria or Germany, or conducted the interview by phone.

The sample is unique in several dimensions. First, it includes detailed information on parent firms in Austria and Germany. Second, it contains information about how and where the investment is financed. Third, it includes information on affiliates in Eastern Europe and their environment. The sample consists of quantitative as well as qualitative information. German and Austrian investment in Eastern Europe go predominantly to Central Europe including the Czech and Slovak Republic, Hungary, and Poland (over 80 percent), to Southern Europe including Bulgaria, Croatia, and Romania (16 and 12 percent, respectively), and to the former Soviet Union including Russia and Ukraine (7.4 and 6.2 percent, respectively).

Empirical predictions and results

Our first prediction is based on Lemmas 4 and 5. The investor chooses a small credit when the managerial effort problem is large and a large credit when the repayment problem is severe. A small credit leaves more payoff to the manager

and hence provides high powered incentives for him to spend effort. A large credit forces the manager to repay more of the investment returns to the investor to avoid liquidation and thus mitigates the repayment problem. Hence, we expect the size of the credit to be driven by the different incentive problems.

Hypothesis 1 *The size of the credit tends to be larger, the larger the repayment problem and the smaller the effort problem.*

Our next prediction is based on Result 2. The larger the distance the less effective is the investor in monitoring the manager and hence the less the manager needs to be motivated by a small credit to spend effort. Thus the investor is less likely to choose a small credit.

Hypothesis 2 *The size of the credit tends to be larger, the larger the distance.*

The empirical findings on the predictions are reported in Table 2. Table 2 presents Logit regressions where the dependent variable is a dummy $D = 1$ if the credit is large as opposed to small. We specify a credit as being large if the credit size exceeds 50 % of the investment.

We capture the repayment problem by the variable Market size. This variable measures to what extend the investment was motivated by the size of the local market. It runs from 1 to 5, where 5 means that market size was the prime motivation and 1 means that the market size played no role for the investment decision. The idea is that when market size is big, the project is expected to generate large profits and hence the manager may have a large incentive to hide part of the profits. Our model predicts that in this case, a large credit is needed to discipline the manager. Therefore we expect a positive sign. Table 2 shows that this is indeed the case and that the coefficient is significant when fixed effects are included.

We capture the effort problem by the R&D/ sales ratio. This variable measures the ratio of R&D expenditures and sales of the investor's local investment project.

The larger this R&D ratio, the less the investment relies on standard procedures and hence the more important is the manager's effort to induce a high return. According to our model we expect a negative coefficient, because the more important it is to motivate the manager to spend effort the smaller should be the credit. Table 2 shows that the sign of the coefficient is as expected but not significant.

The variable distance has a positive coefficient, as predicted. However, when home country fixed effects are included it is no longer significant.

We include the variable affiliate size as a control variable to capture the need to finance the project with a credit. The idea here is that larger affiliates will find it easier to finance the project out of cash flow as compared to smaller affiliates. The negative coefficient indeed suggest that the larger the affiliate size, the larger the expected cash flow generated by this affiliate and hence the less need there is to finance the project externally via a credit.

We also include the variable corruption to control for a bank's readiness to extend a credit. Corruption risk as perceived by the investor is severe when the variable takes the value 5 and is small when it takes the value 1. Not surprisingly we find that corruption has a negative impact on credit size, but it is only marginally significant.

Finally, we include the variable global bank to capture the location of the bank credit taken by the investor. We find that credits taken from a bank in Austria or Germany tend to be smaller than credits taken locally from a bank in Eastern Europe. At first glance, this result may seem counterintuitive. Considering the development of the local banking markets one might have expected global banks to have a comparative advantage in financing large credits. Table 2 shows that this is not the case. Interestingly, this result is entirely consistent with Result 3 from our model which suggests that large credits are preferably taken at local banks.

Columns (6) - (8) reestimate the equation with industry fixed effects, home fixed effects (Austria, Germany) and host fixed effects, with similar results. Only the variable distance becomes insignificant when home dummies are included in

the regression.

(Table 2 here)

Our next hypothesis is about the choice of local versus global banks.

Hypothesis 3 Local Bank versus Global Bank

- *The larger the repayment problem, the more the investor is inclined to choose local bank finance as opposed to global bank finance.*
- *The larger the distance, the more likely is local bank finance as opposed to global bank finance.*

As we have seen above, the investor chooses a large credit to discipline the manager's repayment problem. Result 3 implies that a large credit should be taken from a local bank because the local bank can generate a higher liquidation value than a global bank and thus involves lower capital cost. Furthermore, as we know from Result 2 and as we have just seen, larger credits are more likely the larger the distance. Since local banks are the preferred choice for large credits, we expect local credits to become more likely the larger the distance.

This hypothesis is tested in Table 3. The dependent variable in this Logit Regression is a dummy equal to 0 if the credit is taken from a German or Austrian bank, and equal to 1, if the credit is taken locally.

Like above, we capture the repayment problem by market size. We expect a positive sign and this is indeed the case, significant in (almost) all specifications.

Again, the variable R&D/Sales is used to capture the effort problem. This effort problem favors small credits, but since there is no clear prediction what bank the investor chooses when she prefers a small credit we have no prediction for the sign of the coefficient. Indeed, we find that the coefficient of the R&D variable is insignificant in all specifications.

We include the variable distance, which measures the distance between headquarters and local investment project. The coefficient is positive, as expected, and

significant in some of the specifications, but no longer so when home country fixed effects are included.

(Table 3 here)

Our last hypothesis is based again on Results 1 and 3. This hypothesis captures the decision between local and global financing.

Hypothesis 4 Local versus Global Finance

- *The larger the repayment problem, the more likely is local finance as opposed to global finance.*
- *The larger the effort problem, the more likely is local finance as opposed to global finance.*

Results 1 and 3 state that the investor will take a large credit from a local bank when the repayment problem is large. A large credit is called for to discipline the manager because it forces him to repay the returns of the investment project to avoid liquidation. A local bank is called for if the credit is large because the local bank can generate a higher liquidation value and thus saves on capital costs. The second part of the Hypothesis follows also from Results 1 and 3. When the managerial effort problem is large the investor wants to avoid to discipline the manager too much and hence chooses a small credit from a local bank rather than internal cash to finance the project.

Market size and R&D/Sales capturing the repayment problem and the effort problem, respectively, have the expected positive sign and are significant in all specifications, including the specifications with fixed effects. The investor chooses a local bank when the repayment problem and the managerial effort problem are severe. She can discipline the manager's repayment problem with a large local loan and she can provide high powered incentives to mitigate the effort problem with a small local loan rather than internal cash financing.

We also include a number of other variables for which we have no prediction. Distance has a negative sign which suggests that the investor chooses internal finance when the affiliate is remote. When the manager is at a distance monitoring is less effective and thus no local credit is needed to provide incentives for the manager. Distance, however turns insignificant when country fixed effects are included in the regression.

We also control for property rights. Interestingly, better property rights do not favor local credits. One possible interpretation is that the investor is more likely to receive global credits and more willing to invest her own money when property rights are strong.

Not surprisingly, we find that Exchange rate risk increases the use of local financing and banking underdevelopment reduces the use of local bank financing. Both variables have significant coefficients, but their inclusion does not change the results.

(Table 4 here)

7 Conclusion

In this paper we have studied the question to what extent foreign direct investments involve a capital flow to the host country. We have found that investments tend to be financed locally if the investor worries about capturing the returns of the investment and about giving incentives to the manager to spend effort. So, local financing is the choice for investment projects that exhibit large managerial incentive problems. Capital flows take place if the investment involves rather standard technology, the returns of which are relatively easy to appropriate, i.e. if neither of the two incentive problems is too large. Hence technology transfer and capital flows are not as complementary as is often thought.

Appendix

Proof of Lemma 1

Note that the following first order condition maximizes the manager's payoff

$$(1-\beta)R + (1-\alpha)(Z-L) - C'(p) = 0. \tag{25}$$

Using the implicit function theorem we can show that

$$\frac{dp}{dL} = -\frac{-(1-\alpha)}{-C''(p)} = -\frac{(1-\alpha)}{C''(p)} < 0 \tag{26}$$

and

$$\frac{dp}{d\beta} = -\frac{-R}{-C''(p)} = -\frac{R}{C''(p)} < 0. \tag{27}$$

Q.E.D.

Proof of Lemma 2

Note that the investor maximizes her payoff with the following first order condition

$$pR - \frac{dM}{d\beta} = 0 \tag{28}$$

Using the implicit function theorem, we can derive

$$\frac{d\beta}{dp} = -\frac{R}{-\frac{d^2M}{d\beta^2}} > 0 \tag{29}$$

and

$$\frac{d\beta}{dd} = -\frac{-\frac{d^2M}{d\beta dd}}{-\frac{d^2M}{d\beta^2}} < 0 \tag{30}$$

Q.E.D.

Proof of Lemma 3

The equilibrium is described by the following two first order conditions

$$(1-\beta^*)R + (1-\alpha)(Z-L) - C'(p^*) = 0 \tag{31}$$

$$p^*R - \frac{dM(\beta^*, d)}{d\beta} = 0 \tag{32}$$

Using the implicit function theorem for linear equation systems we can derive the following properties.

$$\frac{dp^*}{dL} = \frac{|F_{pL}|}{|F|} = \frac{\begin{vmatrix} (1-\alpha) & -R \\ 0 & -\frac{d^2M}{d^2\beta} \end{vmatrix}}{\begin{vmatrix} -C''(p) & -R \\ R & -\frac{d^2M}{d\beta^2} \end{vmatrix}} = \frac{-(1-\alpha)\frac{d^2M}{d\beta^2}}{C''(p)\frac{d^2M}{d\beta^2} + R^2} < 0 \tag{33}$$

$$\frac{d\beta^*}{dL} = \frac{|F_{\beta L}|}{|F|} = \frac{\begin{vmatrix} -C''(p) & (1-\alpha) \\ R & 0 \end{vmatrix}}{\begin{vmatrix} -C''(p) & -R \\ R & -\frac{d^2M}{d\beta^2} \end{vmatrix}} = \frac{-(1-\alpha)R}{C''(p)\frac{d^2M}{d\beta^2} + R^2} < 0 \tag{34}$$

$$\frac{dp^*}{dd} = \frac{|F_{pd}|}{|F|} = \frac{\begin{vmatrix} 0 & -R \\ \frac{d^2M}{d\beta dd} & -\frac{d^2M}{d\beta^2} \end{vmatrix}}{\begin{vmatrix} -C''(p) & -R \\ R & -\frac{d^2M}{d\beta^2} \end{vmatrix}} = \frac{R\frac{d^2M}{d\beta dd}}{C''(p)\frac{d^2M}{d\beta^2} + R^2} > 0 \tag{35}$$

$$\frac{d\beta^*}{dd} = \frac{|F_{\beta d}|}{|F|} = \frac{\begin{vmatrix} -C''(p) & 0 \\ R & \frac{d^2M}{d\beta dd} \end{vmatrix}}{\begin{vmatrix} -C''(p) & -R \\ R & -\frac{d^2M}{d\beta^2} \end{vmatrix}} = \frac{-C''(p)\frac{d^2M}{d\beta dd}}{C''(p)\frac{d^2M}{d\beta^2} + R^2} < 0 \tag{36}$$

Q.E.D.

Proof of Lemma 5

We want to show that for large credits equilibrium values p^* and β^* are lower than in case of internal financing, provided $D > L$, i.e. $p^*(D) \equiv \underline{p} < p \equiv p^*(L)$, and similarly $\beta^*(D) \equiv \underline{\beta} < \beta \equiv \beta^*(L)$.

To see this recall that the investor's and manager's expected payoffs, for a given D are

$$K + p[\beta R + \alpha(Z - D)] + (1 - p)0 - M(\beta, d) \tag{37}$$

and

$$p[(1 - \beta)R + (1 - \alpha)(Z - D)] - C(p) \tag{38}$$

So the equilibrium in case of a large credit is described by the following two first order conditions

$$\begin{aligned} (1 - \beta^*)R + (1 - \alpha)(Z - D) - C'(p^*) &= 0 \quad (39) \\ p^* R - \frac{dM(\beta^*, d)}{d\beta} &= 0 \quad (40) \end{aligned}$$

These conditions are identical with the ones in case of internal financing, only L is replaced by D. So the same properties as the one established in Lemma 3 apply.

Q.E.D.

Proof of Result 2

To see this reconsider the condition for choosing a large credit from above. We show that as d increases, the terms are affected as indicated by $(-)$ or $(+)$.

$$\underbrace{-\overbrace{(p - \underline{p})}^{(-)_1}[\alpha(Z - D) + (1 - \alpha)(D - L_B)] - \overbrace{[(p\beta R - M(\beta, d)) - (\underline{p}\underline{\beta} R - M(\underline{\beta}, d))]}^{(-)_2}}_{\text{efficiency effect}} \tag{41}$$

$$+\underbrace{\overbrace{p}^{(+)_3}(1 - \alpha)(D - L)}_{\text{rent shifting effect}} - \underbrace{\overbrace{(1 - p)}^{(-)_4}(L - L_B)}_{\text{capital cost effect}} \geq 0$$

Consider first $(-)_1$. This follows from the fact that $\frac{d^2 p}{d(-L)dd} < 0$. To see this recall that

$$\frac{dp^*}{dL} = \frac{-(1 - \alpha)\frac{d^2 M}{d^2 \beta}}{C''(p)\frac{d^2 M}{d\beta^2} + R^2} < 0 \tag{42}$$

Hence

$$\frac{d^2p^*}{dLdd} = \frac{(1-\alpha)\frac{d^2M}{d^2\beta}\left[\frac{d^2M}{d\beta^2}C'''(p)\frac{dp}{dd}\right]}{\left(C''(p)\frac{d^2M}{d\beta^2}+R^2\right)^2} > 0 \tag{43}$$

and therefore $\frac{d^2p}{d(-L)dd} < 0$ i.e. the positive efficiency effect of lowering the liquidation value is reduced the larger the distance.

Consider next $(-)_2$.

To see this consider

$$\frac{d[p\beta R - M(\beta,d)]}{d(-L)} = \frac{dp}{d(-L)}\beta R + \frac{d\beta}{d(-L)}\underbrace{(pR - \frac{dM(\beta,d)}{d\beta})}_{=0} > 0 \tag{44}$$

$$\frac{d^2[p\beta R - M(\beta,d)]}{d(-L)dd} = \underbrace{\frac{d2p}{d(-L)dd}}_{-}\beta R + \underbrace{\frac{dp}{d(-L)}}_{+}R\,\underbrace{\frac{d\beta}{dd}}_{-} < 0 \tag{45}$$

Consider finally $(+)_3$ and $(-)_4$. They follow directly from Lemma 3 which establishes that $\frac{dp}{dd} > 0$.

Note that the effects in case of a small credit are affected in exactly the same fashion.

Q.E.D.

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Definition of Variables and Sample Statistics

Variable	Observations	Description	Mean	Min.	Max.	Std Dev.
large vs. small credit	595	Dummy variable equal to one if firm financed the investment by more than 50% of the total investment sum by a bank credit (large credit)	D=1, 340 observations			
local vs. global bank	596	Dummy variable equal to one if FDI investor involved host bank only in Eastern Europe to finance investment Dummy variable equal to zero if FDI investor involved bank in (a) Austria and Germany or (b) Austria, Germany and Eastern Europe to finance investment	D=1, 66 observations			
local vs. global finance	2123	Dummy variable equal to one if FDI investor involved host bank in Eastern Europe to finance investment Dummy variable equal to zero in all other cases	D=1, 133 observations			
global bank	529	Dummy variable equal to one if FDI investor involved bank only in Germany or Austria to finance investment Dummy variable equal to zero if FDI investor involved bank only in Eastern Europe to finance investment	D=1, 463 observations			
market size	2102	ranges from 1 to 5 with 5 when market size is prime motivation and 1 when market size plays no role	3.82	1	5	
market size	2102	Dummy variable equal to one if firm perceived market size as very important	D=1, 1389 observations			
R&D /Sales	1619	affiliate R&D expenditure / affiliate sales (in %)	2.08	0.00	82.20	11.84
distance		distance between parent and affiliate (in km)	906	17	6000	800.31
exchange rate risk	2123	Dummy variable equal to one if firm perceived exchange rate risk as important	D=1, 694 observations			
banking underdevelopment	2123	Dummy variable equal to one if firm perceived banking development in Eastern European country as poor	D=1, 216 observations			
affiliate size	1962	affiliate employment	339	0	49000	1643.32
corruption	1683	ranges from one to five with five if firm perceived corruption risk as important and one if corruption risk plays no role	2.58	1	5	
property rights	2058	ranges from one to five with five if firm perceived property rights as strong and one if property rights are weak	4.08	1	5	

Table 2 - Choice of Credit Size

Dependent variable: Dummy Large Credit (1) versus Small Credit (0)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Market size	0.050	0.024	-0.044		0.112	0.185**	0.140*	0.257***
	(0.80)	(0.37)	(0.65)		(1.61)	(2.35)	(1.96)	(3.01)
Ln(R&D/Sales)	-0.035	-0.024	-0.012	-0.014	0.027	0.016	0.021	0.016
	(1.16)	(0.78)	(0.36)	(0.42)	(0.70)	(0.37)	(0.53)	(0.37)
Ln(Distance)	0.277**	0.269**	0.222*	0.233*	0.245**	0.293**	0.130	
	(2.48)	(2.40)	(1.82)	(1.93)	(2.00)	(2.26)	(0.95)	
Affiliate size		-0.001**	- 0.001**	-0.001**	-0.001**	- 0.001**	-0.001**	-0.001**
		(2.01)	(2.16)	(2.11)	(2.37)	(2.03)	(2.47)	(2.03)
Corruption			-0.152	-0.161*				
			(1.59)	(1.69)				
Global bank					- 0.856**	-0.810**	-0.750**	-0.785**
					(2.51)	(2.28)	(2.16)	(2.13)
Industry fixed effects	no	no	no	no	no	yes	no	yes
Home country fixed effects	no	no	no	no	no	no	yes	yes
Host country fixed effects	no	no	no	no	no	no	no	yes
Constant	-1.462**	-1.300*	-1.674*	-1.675*	0.242	1.859	1.184	2.813
	(2.02)	(1.78)	(1.89)	(1.89)	(0.27)	(1.33)	(1.14)	(1.51)
Observations	470	470	407	407	408	405	408	398
Pseudo R^2	0.013	0.023	0.024	0.024	0.045	0.102	0.051	0.118

Logistic regressions, absolute value of z statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Market size: ranges from 1 to 5 with 5 when market size is prime motivation and 1 when market size plays no role
R&D/sales: affiliate R&D expenditure / affiliate sales
Distance: Distance between parent and affiliate
Affiliate size: Affiliate employment
Corruption: ranges from 1 to 5 with 5 when firm perceived corruption risk as important and 1 when corruption risk plays no role
Global bank: Dummy variable D=1 if FDI investor involved bank only in Austria or Germany to finance investment

Table 3 - Local versus Global Bank

Dependent variable: Dummy Local Bank (1) versus Global Bank (0)

	(1)	(2)	(3)	(4)	(5)	(6)
Market size	0.192*	0.210**	0.074	0.244**	0.336***	0.297**
	(1.94)	(2.06)	(0.55)	(2.13)	(2.70)	(2.20)
Ln(R&D/Sales)	-0.016	-0.004	-0.098	-0.025	-0.039	-0.055
	(0.29)	(0.08)	(0.90)	(0.40)	(0.61)	(0.82)
Ln(Distance)		0.440**	-0.098	0.483***	-0.022	0.134
		(2.56)	(0.42)	(2.75)	(0.10)	(0.38)
Corruption			-0.199			
			(1.02)			
Industry fixed effects	no	no	no	yes	yes	yes
Home country fixed effects	no	no	no	no	yes	yes
Host country fixed effects	no	no	no	no	no	yes
Constant	-1.421***	-4.127***	-2.967	-3.052*	1.108	-2.137
	(3.24)	(3.51)	(1.60)	(1.79)	(0.54)	(0.60)
Observations	412	409	347	400	400	380
Pseudo R^2	0.012	0.033	0.014	0.071	0.125	0.149

Logistic regressions, absolute value of z statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Market size: ranges from 1 to 5 with 5 when market size is prime motivation and 1 when market size plays no role

R&D/sales: affiliate R&D expenditure / affiliate sales

Distance: Distance between parent and affiliate

Corruption: ranges from 1 to 5 with 5 when firm perceived corruption risk as important and 1 when corruption risk plays no role

Table 4 - Local versus Global Finance

Dependent variable: Dummy Local Finance (1) versus Global Finance (0)

	(1)	(2)	(3)	(4)	(5)
Market size	0.660***	0.538**	0.613***	0.564**	
	(2.91)	(2.11)	(2.65)	(2.20)	
Ln(R&D/Sales)	0.110***	0.127***	0.125***	0.135***	0.138***
	(4.21)	(3.96)	(4.53)	(4.16)	(4.32)
Ln(Distance)	-0.247**	0.176	-0.468***	0.122	0.146
	(2.32)	(0.86)	(4.06)	(0.59)	(0.71)
Property rights			-0.212**	-0.163*	-0.165*
			(2.45)	(1.65)	(1.67)
Exchange rate risk		1.211***	0.947***	1.105***	1.121***
		(5.87)	(4.85)	(5.10)	(5.21)
Banking underdevelopment		-1.398***	-0.827***	-1.461***	-1.462***
		(5.32)	(4.36)	(5.43)	(5.54)
Industry fixed effects	no	yes	no	yes	yes
Home country fixed effects	no	yes	no	yes	yes
Host country fixed effects	no	yes	no	yes	yes
Constant	-0.788	-1.263	1.105	-0.187	0.098
	(1.11)	(0.57)	(1.27)	(0.09)	(0.05)
Observations	1597	1502	1551	1458	1467
Pseudo R^2	0.035	0.182	0.088	0.185	0.180

Logistic regressions, absolute value of z statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Market size:	Dummy D=1 when market size is very important motivation for FDI investor
R&D/sales:	affiliate R&D expenditure / affiliate sales
Distance:	Distance between parent and affiliate
Property rights:	ranges from 1 to 5 with 5 when property rights are strong and 1 when property rights are weak
Exchange rate risk:	Dummy variable D=1 when firm perceived exchange rate risk as important
Banking underdevelopment:	Dummy variable D=1 when firm perceived banking development in Eastern European country as poor