

Some Aspects regarding the Dynamic Correlation between Different Types of Strategic Investments in Romania after Integration

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Abstract: There are two major types of international equity flows. In the literature there are only few publications focused on the bilateral correlation between Foreign Direct Investment (FDI) and Foreign Portfolio Investment (FPI) in a robust analytical framework. We consider Lipsey-Razin model to explain the dynamics of foreign investment option in Romania after European integration and the recent financial global crises, in the aftermath of subprime. There are two distinct aspects: the reallocation of investors between FDI and FPI after European integration in the context of euro macroeconomic cycle which leads welfare parameters an early withdrawal; the effects of financial contagion on FPI and Romanian stock exchange.

Keywords: FDI (foreign direct investment), FPI (foreign portfolio investment), recession, European integration, global financial crisis.

1 Introduction

The dynamics of changing the main types of international equity flows in Romania after integration should be analyzed by considering the global evolution and future trends of financial flows, the liquidity aspects and the contagion effects on local markets. We use Lipsey-Razin model of a trade off between FDI/FPI which highlights the selection decision aspects. The costs associated to FDI are: the initial fixed costs (especially for Greenfield investments, terrain acquisition, building, training, could be considerable); the information-based costs, exogenous and resulting from the capacity to sell quickly their investments before maturity (in liquidity shocks, potential buyers will pay only a lower price because they suspect an asymmetrical information on the prospects of investments).

These costs are also driven by the volatility and liquidity and depend on the macroeconomic context but also on the turbulences existing on international financial markets. The difficulty of FDI withdrawals may create a bias of less illiquidity-prone investors, such as big multinationals. Institutional investors, who are subject to frequent withdrawals, are biased in favor of FPI. By using Lipsey-Razin model we could analyze the trade-off between management efficiency and liquidity which

have strong empirical evidence; we also add the effect of asymmetric information for different types of control. The increasing of the control increases also the efficiency and value of the firm (Perez-Gonzalez, 2005). There is also a positive response on the capital market (Chari, Ouimet, Tesar, 2007).

Big FDI investors can achieve effective control by holding a block that is much smaller than the majority, but the value of the firm may increase at similar rates. The sale of big blocks by control holders (Rasdaq companies after increasing their capital in the summer of 2007) generates a larger price impact than a sale by other investors, because of a bigger downward effect on the price (Mikkelson, Partch, 1985; Holthausen, Leftwich, 1990; Chan, Lakonishok, 1995). The global price impact of sale in the presence of control can be obtained by analyzing what happens after the firm sells a part of its own shares in the asymmetric information environment (Flamingo, Armax Gaz Medias, Albalact, Prospectiuni, Ceramica Iasi).

An interesting implication of the trade-off between efficiency and liquidity is that investors with high/ vs. low expected liquidity needs are more likely to choose less/ vs. more control. The mechanism is based on the fact that investors with high expected liquidity needs

are affected more by the low sale price associated with control, whereas those with low expected liquidity needs are affected more by the efficiency in management. In this case, the assets under control are less likely to be liquidated prematurely (Hennart, Kim, Zeng, 1998). Big investors are much more likely to exit from joint ventures than from fully owned investments with more control. FDI exhibit more control than FPI which expected to be liquidated less often, in the global context of international portfolio management. The instruments of FPI could be: a direct investment in local stock exchange (blue chips, Investment Financial Companies- with balanced portfolio, IPO hunting) or by using a special vehicle of investment like open end investment funds/ close /end investment funds managed by financial intermediaries.

2 The selection from the existing models in the literature

Albuquerque model explain the differences between the volatility of FDI versus the volatility of FPI, but is not considered the effect of liquidity and the macroeconomic facts or the international financial environment. Albuquerque is focused on the expropriation risks and the inalienability of direct investments, and thus is different from the information-based mechanism.

In other papers related to FDI, it is used the asymmetric information hypothesis (Froot, Stein, 1992; Klein, Rosengren, 1994; Klein, Peek, 2002). The authors use the hypothesis that FDI is information intensive, and thus FDI investors, who know more about their investments than outsiders do, face a problem in raising resources for their investments. Gordon, Bovenberg (1996) use the asymmetric information between domestic investors and foreign investors to explain the home bias phenomenon. Razin, Sadka, Yuen (1998) explain the pecking order of international capital flows with a model of asymmetric information. A new model of Razin and Sadka (2005) analyze the gains from FDI when investors have superior information on the fundamentals, relative to FPI investors. All these analyze could not consider the effects of asymmetric information on the liquidity of FDI and FPI, which is a very important aspect.

In **Lipsey-Razin** model there is a small economy faced by a continuum $[0, 1]$ of foreign risk neutral (the optimality is to maximize ex ante expected payoff) investors with the opportunity to invest in one investment project, FDI (in this case he acts as a manager)/FPI . The timing $(0, 1, 2)$ is the following: in period 0, each investor select the type of investment (FDI/FPI); in period 1, after the realization of the productivity shock, the manager of the project observes ε and chooses K , so as to maximize the net cash flow; in period 2, the project matures.

The net cash flow from the project is $R(K, \varepsilon)$, where ε is a random productivity factor that is independently realized for each project in period 1, and K is the level of capital input invested in the project in period 1, after the realization of s . For tractability we assume that $R(K, \varepsilon)$ takes the special form

$$R(K, \varepsilon) = (1 + \varepsilon)K - \frac{1}{2}BK^2. \quad (1)$$

We assume the cumulative distribution between $(-1, 1)$ and a density function $g(\cdot) = G'(\cdot)$; $E(\varepsilon) = 0$; B , is the production cost parameter and reflects higher production costs and lower productivity gaps.

2.1 A better management and efficiency for FDI

In period 1, the chosen level of K to optimize the net cash flow is denoted by $K^*(\varepsilon)$

$$K^*(\varepsilon) = \frac{1 + \varepsilon}{B}. \quad (2)$$

Thus, the ex-ante expected net cash flow from FDI held until maturity, is given by

$$E = \left(\frac{(1 + \varepsilon)(1 + \varepsilon)}{B} - \frac{1}{2}B \left(\frac{1 + \varepsilon}{B} \right)^2 \right) = \frac{E((1 + \varepsilon)^2)}{2B}. \quad (3)$$

In the case of FPI, the owner is not the manager, does not observe ε and follows earlier instructions as for the level of K . A possible rationale behind this sequence of firm decisions, whereby the level of capital input K is determined ex ante, has to do with a potential agency problem between the owner and the manager to maximize the ex-ante expected payoff

$$E \left(\frac{(1 + \varepsilon)}{B} - \frac{1}{2B} \right) = \frac{E(1 + 2\varepsilon)}{2B} = \frac{1}{2B}. \quad (4)$$

It results a higher payoff in FDI but we must consider the costs: the fixed initial costs (FDI

cost) and the information-based cost, derived endogenously in the model from the possibility of liquidity shocks occurring in period 1.

2.2 The effect of liquidity shocks

Let X the probability of liquidity shocks that could forced early withdrawals. Let a community with two types of investors, $\frac{1}{2}$ with high expected liquidity needs (type H), and $\frac{1}{2}$ with low liquidity needs (type L). We assume for the probabilities associated $1 > \lambda_H > \frac{1}{2} \lambda_L > 0, \lambda_H + \lambda_L = 1$.

Investors know their type ex ante, but this is private information.

There is also a possibility to liquidate the project in period 1 even if there is no liquidity shock which generates another cost associated to FDI. The price of resale in period 1 is equal to the expected value of the project from the point of view of the potential buyer. We denote the maximum level of ε , under which the FDI investor is selling by $\underline{\varepsilon}_D$. We denote by λ_D the probability that an FDI investor gets a liquidity shock. Both $\underline{\varepsilon}_D$ and λ_D will be endogenously determined in equilibrium. Given that FDI owner is selling, the buyer thinks that with probability $(1 - \lambda_D)G(\underline{\varepsilon}_D)$ the owner is doing so due to a low realization of ε , and with probability λ_D that she is selling the projects because of a liquidity shock. Using Bayes's rule, the period 1 price that the direct investor gets for the project is given by

$$P_{1,D} = \frac{(1 - \lambda_D) \int_{-1}^{\underline{\varepsilon}_D} \frac{(1+\varepsilon)^2}{2A} g(\varepsilon) d\varepsilon + \lambda_D \int_{-1}^1 \frac{1+2\varepsilon}{2A} g(\varepsilon) d\varepsilon}{(1 - \lambda_D)G(\underline{\varepsilon}_D) + \lambda_D} \quad (5)$$

The initial owner sets the threshold level $\underline{\varepsilon}_D$, such that, given $P_{1,D}$ while observing $\underline{\varepsilon}_D$:

$$P_{1,D} = \frac{(1 + \underline{\varepsilon}_D)^2}{2B} \quad (6)$$

From (5), (6) we determine $\underline{\varepsilon}_D$ and $P_{1,D}$ as functions of the market-perceived probability λ_D , denoted by $\underline{\varepsilon}_D(\lambda_D)$ and $P_{1,D}(\lambda_D)$ which are increasing in λ_D (when λ_D is high, the buyer thinks that the probability for early sale results from a liquidity shock and not from a bad realization of the productivity parameter and the resale price is high). A consequence is that investors have a greater incentive to choose

FDI in period 0, when the market participants think that investors with high liquidity needs choose FDI.

When a FPI investor sells in period 1, everybody knows that is due to a liquidity shock. The price is given by

$$P_{1,D} = \int_{-1}^1 \frac{1+2\varepsilon}{2B} g(\varepsilon) d\varepsilon = \frac{1}{2B} \quad (7)$$

In this case, the resale price in period 1 of FDI is always lower than the resale price of FPI, and this is also a consequence of the liquidity.

3. Ex-Ante Choice between FDI and FPI

3.1 Expected Value of FDI

With λ_i ($i = H, L$) probability, a type i investor gets a liquidity shock and sells the project in period 1 at the market price:

$$P_{1,D}(\lambda_D) = \frac{(1 + \underline{\varepsilon}_D(\lambda_D))^2}{2B}$$

With probability $1 - \lambda_i$, the investor does not get a liquidity shock. The investor sells if the realization of e is below $\underline{\varepsilon}_D(\lambda_D)$ according to equations (5), (6). The expected payoff in the state of no liquidity shock is

$$\int_{-1}^{\underline{\varepsilon}_D(\lambda_D)} \frac{(1 + \underline{\varepsilon}_D(\lambda_D))^2}{2B} g(\varepsilon) d\varepsilon + \int_{\underline{\varepsilon}_D(\lambda_D)}^1 \frac{(1 + \varepsilon)^2}{2B} g(\varepsilon) d\varepsilon$$

In addition, FDI investor has to incur a fixed cost of C and the ex-ante expected net cash flow is:

$$EV_{Direct}(\lambda_i, \lambda_D, B) = (1 - \lambda_i) \left[\int_{-1}^{\underline{\varepsilon}_D(\lambda_D)} \frac{(1 + \underline{\varepsilon}_D(\lambda_D))^2}{2B} g(\varepsilon) d\varepsilon \right] + \int_{\underline{\varepsilon}_D(\lambda_D)}^1 \frac{(1 + \varepsilon)^2}{2B} g(\varepsilon) d\varepsilon + \lambda_i \frac{(1 + \underline{\varepsilon}_D(\lambda_D))^2}{2B} - C \quad (8)$$

3.2 The expected value of FPI investments

When the investor holds the FPI with probability λ_i , in a liquidity shock with resale in period 1 the price is:

$$P_{1,P} = \frac{1}{2B}$$

With probability $1 - \lambda_i$ the investor does not receive a liquidity shock and the expected net cash flow is:

$$\frac{E(1 + 2\varepsilon)}{2B} = \frac{1}{2B}$$

The ex-ante expected net cash flow from a portfolio investment is given by

$$EV_{\text{Portfolio}}(B) = \frac{1}{2B} \tag{9}$$

3.3 The differences between the expected value of FDI and FPI

This difference between the two expected values is:

$$\text{Diff}(\lambda_i, \lambda_D, B) = EV_{\text{Direct}}(\lambda_i, \lambda_D, B) - EV_{\text{Portfolio}}(B)$$

and the choice FDI vs. FPI is governed by the parameters B and C . Investor i is more likely to choose FDI when: the FDI cost C is lower; the productivity cost B is lower; the probability of a liquidity shock X_t is lower, the market-perceived probability λ_D of a liquidity shock for FDI investors is higher.

4 The allocation of investors between FDI/FPI

To describe the equilibrium, it is necessary to specify λ_D . If λ_D is in line with the equilibrium choice of investors between FDI/FPI:

$$\lambda_D = \frac{\lambda_H \lambda_{H,FDI} + \lambda_L \lambda_{L,FDI}}{\lambda_{H,FDI} + \lambda_{L,FDI}} \tag{11}$$

where $\lambda_{H,FDI}$ is the proportion of λ_H investors who choose FDI in equilibrium and $\lambda_{L,FDI}$ is the proportion of λ_L investors who choose FDI in equilibrium. There are five cases at equilibrium: all λ_H and λ_L investors choose FDI; all λ_L investors choose FDI and λ_H investors split between FDI and FPI; all λ_L investors choose FDI and all λ_H investors choose FPI; λ_L investors split between FDI and FPI and all λ_H investors choose FPI; all λ_H and λ_L investors choose FPI. In real economies FDI and FPI coexist. The differences between expected liquidity needs for a representative FDI investor and those for a representative FPI investor depends on volatility, liquidity, macroeconomic situation and international financial picture. In Figure 1 is presented a full characterization of the equilibrium allocation of investors as a function of λ_H the probability that investors with high expected liquidity needs will get a liquidity shock, and B .

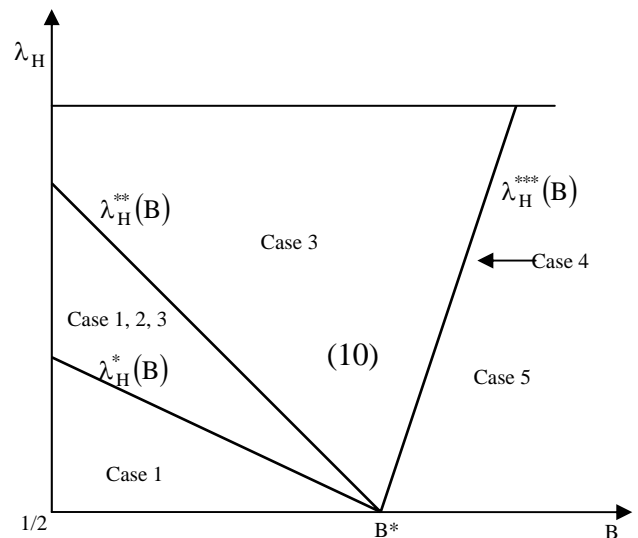


Figure 1 – The allocation of investors between FDI and FPI

5 Conclusions

FDI investors are more informed about the fundamentals of their projects and this information enables them to manage their projects more efficiently. It results also an asymmetric-information problem in case they need to sell their projects permanently, and reduces the price they can get in that case. As a result, investors who know they are more likely to get an idiosyncratic liquidity shock that forces them to sell early are more likely to choose FPI, whereas investors who know they are less likely to get a liquidity shock are more likely to choose FDI. The model generates several results that are consistent with empirical evidence in Romanian economy which attracted larger shares of FPI after EU integration. Romania supplies a lower labor costs that make high added value business more profitable. After integration, the high transparency of the capital market makes FPI more efficient, in the context of reducing FDI after BCR privatization. The model can account for the high observed withdrawal rates of FPI relative to FDI, which also contribute to a high volatility of the former relative to the latter. It is also observed that increasing transparency implied smaller differences between the withdrawal ratios of FPI vs. FDI. It is interesting to remark the behavior of Romanian capital market after subprime crisis in US. The capacity to attract more investors with low expected liquidity needs to FPI is in danger now and it

could also result a separation between investors with low expected liquidity needs and those with high expected liquidity needs. The main conclusions are: a) The expected liquidity needs of FDI investors are lower. Liquidity shocks are more common among FPI than among FDI investors. Investors with high expected liquidity needs and speculators are not interested about the long-term efficiency of FDI, and care more about the short-term price, having a higher tendency to invest in FPI. Investors with low expected liquidity needs prefer FDI. FPI investors are more vulnerable to liquidity shocks. This result contributes to the high withdrawal ratio of FPI relative to FDI, which can account for the empirically observed higher volatility of net FPI inflows; b) As B , the production cost parameter increases, there will be more FPI and less FDI at equilibrium. As the level of B , the cost of production in the host country, increases, equilibrium outcomes changes in a gradually preference for more FPI and less FDI. Since B represents the cost of production, we expect developed countries to have higher levels of B ; c) When FDI investors acquire a firm in a developing country, it transfers TFP in the source country to the new firm, reducing the productivity cost B which strengthens the relative attractiveness of developing countries for FDI; d) As the liquidity need heterogeneity among investor's increases, a separating equilibrium – with a large difference between the withdrawal rate of FPI and the withdrawal rate of FDI – becomes more likely. When $B < B^*$, an increase in λ_H shifts the equilibrium outcome e) There is a domain of the fundamentals (B, λ_H, C) with multiple equilibria. Multiple equilibria exist when $B < B^*$ and $\lambda_H^*(B) < \lambda_H < \lambda_H^{**}(B)$. In this region, Cases 1, 2, and 3 are possible equilibria. The reason for the multiplicity is the existence of externalities among λ_H investors. This multiplicity may generate severe jumps from equilibrium with a lot of direct investments to equilibrium with significantly fewer direct investments. This may explain why some countries have more direct investments than other countries with similar characteristics, and why some periods of time

are characterized by more direct investments than others. The existence of multiple equilibria also generates interesting welfare implications.

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