Liquidity, Institutional Quality and the Composition of International Equity Outflows (SLIDES, January 2008)

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Abstract

We examine the choice between Foreign Direct Investment and Foreign Portfolio Investment at the level of the source country. Based on a theoretical model, we predict that (1) source countries with higher probability of aggregate liquidity crises export relatively more FPI than FDI, and (2) this effect strengthens as the source country's capital market transparency worsens. To test these hypotheses, we apply a dynamic panel model and examine the variation of FPI relative to FDI for 140 source countries from 1985 to 2004. Our key variable is the probability of an aggregate liquidity crisis, estimated from a Probit model, as proxied by episodes of economy-wide sales of external assets. Consistent with our theory, we find that the probability of a liquidity crisis has a strong effect on the composition of foreign equity investment. Furthermore, greater capital market opacity in the source country strengthens the effect of the crisis probability.

1 Introduction

2 Model

2.1 Goldstein and Razin (2006): Idiosyncratic Liquidity Shocks

A trade-off between efficiency and liquidity

2.1.1 Efficiency of FDI

$$\mathbf{R}(\mathbf{K}, \boldsymbol{\varepsilon}) = (\mathbf{1} + \boldsymbol{\varepsilon})\mathbf{K} - \frac{1}{2}\mathbf{A}\mathbf{K}^2, \tag{1}$$

$$\mathbf{K}^d(\boldsymbol{\varepsilon}) = \frac{1+\varepsilon}{A}. \tag{2}$$

$$\frac{E\left((1+\varepsilon)^2\right)}{2A}. \tag{3}$$

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2.1.2 Costs of FDI

The Buyer Price:

$$\mathbf{P}_{1,D} = \frac{(1-\lambda_D)\, G(\underline{\varepsilon}_D) \int_{-1}^{\underline{\varepsilon}_D} \frac{(1+\varepsilon)^2}{2A} \frac{g(\varepsilon)}{G(\underline{\varepsilon}_D)} d\varepsilon + \lambda_D \int_{-1}^{1} \frac{1+2\varepsilon}{2A} g(\varepsilon) d\varepsilon}{(1-\lambda_D)\, G(\underline{\varepsilon}_D) + \lambda_D}. \tag{4}$$

$\int_{-1}^{\underline{\varepsilon}_D} \frac{(1+\varepsilon)^2}{2A} \frac{g(\varepsilon)}{G(\underline{\varepsilon}_D)} d\varepsilon$ **is the (posterior probability) expected payoff, if the stock comes from the low productivity pool of firms;**

$\int_{-1}^{1} \frac{1+2\varepsilon}{2A} g(\varepsilon) d\varepsilon$ **is the (posterior probability) expected payoff, if due to liquidity shocks, the stock comes from the fool pool of firms;**

$\frac{(1-\lambda_D)G(\underline{\varepsilon}_D)}{(1-\lambda_D)G(\underline{\varepsilon}_D)+\lambda_D}$ **is the fraction of firms (= prior probability) which are sold because of low productivity in period 1.**

The $\underline{\varepsilon}_D$ fdi seller price:

$$\mathbf{P}_{1,D}=\frac{(1+\underline{\varepsilon}_D)^2}{2A}. \tag{5}$$

$$\mathbf{P}_{1,P}=\frac{1}{2A}. \tag{6}$$

2.1.3 The Decision between FDI and FPI

:

$$\begin{aligned} EV_{Direct}(\lambda_i, \lambda_D, A) &= (1-\lambda_i) \left[\begin{array}{c} \int_{-1}^{\underline{\varepsilon}_D(\lambda_D)} \frac{(1+\underline{\varepsilon}_D(\lambda_D))^2}{2A} g(\varepsilon) d\varepsilon \\ + \int_{\underline{\varepsilon}_D(\lambda_D)}^{1} \frac{(1+\varepsilon)^2}{2A} g(\varepsilon) d\varepsilon \end{array} \right] \\ &\quad + \lambda_i \frac{(1+\underline{\varepsilon}_D(\lambda_D))^2}{2A} - C. \end{aligned} \tag{7}$$

$$EV_{Portfolio}(A) = \frac{1}{2A}. \tag{8}$$

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$$\textbf{Diff}\,(\lambda_i, \lambda_D, A) \equiv \textbf{EV}_{Direct}\,(\lambda_i, \lambda_D, A) - \textbf{EV}_{Portfolio}(\textbf{A}). \tag{9}$$

Then, investor i will choose FDI when $Diff\,(\lambda_i, \lambda_D, A) > 0$; will choose FPI when $Diff\,(\lambda_i, \lambda_D, A) < 0$; and will be indifferent between the two (that is,

may choose either FDI or FPI) when $Diff\,(\lambda_i, \lambda_D, A) = 0$.

2.1.4 FDI and FPI in Equilibrium

$$\boldsymbol{\lambda}_D = \frac{\lambda_H \lambda_{H,FDI} + \lambda_L \lambda_{L,FDI}}{\lambda_{H,FDI} + \lambda_{L,FDI}}, \tag{10}$$

Case 1: All investors choose FDI.

Case 2: λ_L investors choose FDI; λ_H investors split between FDI and FPI.

Case 3: λ_L investors choose FDI; λ_H investors choose FPI.

Case 4: λ_L investors split between FDI and FPI; λ_H investors choose FPI.

Case 5: All investors choose FPI.

2.2 Aggregate Liquidity Shock

Suppose now that an aggregate liquidity shock occurs in period 1 with probability q. Once the shock occurs, it becomes common knowledge.

Conditional on the realization of the aggregate liquidity shock, individual investors may be subject to a need to sell their investment at period 1

with probabilities as in the previous section. That is, if a liquidity shock occurs (with probability q) then half of the investors need to sell in

period 1 with probability λ_H and half with probability λ_L. Conditional on the realization of an aggregate liquidity shock, the realizations of

individual liquidity needs are independent of each other. With probability $(1-q)$, an aggregate liquidity shock does not occur. In this case

individual investors never have a liquidity need that forces them to sell at period 1.

This specification of the model is admittedly simple. The idea that we are trying to capture with this specification is that individual investors

are forced to sell their investments early at times when there are aggregate liquidity problems. In those times, some individual investors have

deeper pockets than others, and thus are less exposed to the liquidity issues. Thus, once an aggregate liquidity shock occurs, λ_L investors, who

have deeper pockets, are less likely to need to sell than λ_H investors.

The ex-ante expected net cash flow from FDI in the new model as (we use the superscript Ext to denote expected values in the extended model:

$$\begin{aligned} EV_{Direct}^{Ext}(\lambda_i, \lambda_D, A, q) &= (1-q)\int_{-1}^{1} \frac{(1+\varepsilon)^2}{2A} g(\varepsilon) d\varepsilon \\ &\quad + q \left[(1-\lambda_i) \left[\begin{array}{c} \int_{-1}^{\underline{\varepsilon}_D(\lambda_D)} \frac{(1+\underline{\varepsilon}_D(\lambda_D))^2}{2A} g(\varepsilon) d\varepsilon \\ + \int_{\underline{\varepsilon}_D(\lambda_D)}^{1} \frac{(1+\varepsilon)^2}{2A} g(\varepsilon) d\varepsilon \end{array} \right] + \lambda_i \frac{(1+\underline{\varepsilon}_D(\lambda_D))^2}{2A} \right] - C. \end{aligned} \tag{11}$$

The ex-ante expected net cash flow from FPI:

$$\mathbf{EV}_{Portfolio}^{Ext}(\mathbf{A}) = \frac{1}{2A}. \tag{12}$$

The difference between the expected value of FDI and the expected value of FPI is:

$$\mathbf{Diff}^{Ext}\left(\lambda_i, \lambda_D, A, q\right) \equiv \mathbf{EV}^{Ext}_{Direct}\left(\lambda_i, \lambda_D, A, q\right) - \mathbf{EV}^{Ext}_{Portfolio}(\mathbf{A}). \tag{13}$$

Investor i will choose FDI when $Diff^{Ext}\left(\lambda_i, \lambda_D, A, q\right) > 0$; will choose FPI when $Diff^{Ext}\left(\lambda_i, \lambda_D, A, q\right) < 0$; and will be indifferent between the two (that is,

may choose either FDI or FPI) when $Diff^{Ext}\left(\lambda_i, \lambda_D, A, q\right) = 0$.

2.3 The Role of Opacity

The effect of liquidity shocks on the composition of foreign investment between FDI and FPI is driven by lack of transparency about the

fundamentals of the direct investment or liquidity situation of the firms. If the fundamentals or liquidity situation were publicly known, then

liquidity shocks would not be that costly for direct investors, as the investors would be able to sell the investment at fair price without bearing

the consequences of the lemons problem.

More precisely, suppose that the source country imposes disclosure rules on its investors that ensure the truthful revelation of investment

fundamentals to the public. In such a case, FDI investors will have to reveal the realization of ε once it becomes known to them. Then, since

potential buyers know the true value of the investment, direct investors will be able to sell their investment at $\frac{(1+\varepsilon)^2}{2A}$. Thus, whether or not a

direct investor sells the investment, he is able to extract the value $\frac{(1+\varepsilon)^2}{2A}$, and so the expected value from investing in FDI is $\frac{E\left((1+\varepsilon)^2\right)}{2A} - C$. The

expected value from investing in FPI is $\frac{1}{2A}$ as before. This is because the kind of disclosure requirements we describe here do not affect the

value of portfolio investments. These are requirements that are imposed by the source country, and thus apply only for investments that are

being controlled by source-country investors.

Prediction: the effect of the probability of a liquidity shock on the ratio of FPI and FDI increases in the level of opacity in the source country.

3 Data and Empirical Model

3.1 Data on FPI and FDI

Lane and Milesi-Ferretti (2006) use as a benchmark the official International Investment Position (IIP) estimates.

3.2 Econometric Model

$$\ln\left(FPI/FDI\right)_{it} = \alpha X_{it} + \beta \Pr_{i,t}\left(Liquidity\ Shock_{i,t+1}\right) + \gamma Year_t + u_i + \varepsilon_{it} \tag{14}$$

for source country i at time t. u_i stands for country fixed effect, while ε_{it} follows an i.i.d normal distribution.

When the lagged FPI/FDI may affect the current FPI/FDI.[1] **Hence we estimate, alternatively, the following dynamic panel regression.**

$$\ln\left(FPI/FDI\right)_{it} = \boldsymbol{\phi} \ln\left(FPI/FDI\right)_{i,t-1} + \boldsymbol{\alpha}\mathbf{X}_{it} + \boldsymbol{\beta} \Pr_{i,t}\left(Liquidity\ Shock_{i,t+1}\right) + \boldsymbol{\gamma}\mathbf{Year}_t + \mathbf{u}_i + \boldsymbol{\varepsilon}_{it} \tag{15}$$

There is a complication in estimating equation (15). That is, if ε_{it} is not i.i.d, but serially-correlated, then $\ln\left(FPI/FDI\right)_{i,t-1}$ will be

[1] Arguably, in our model, investors can rebalance their portfolio of assets every period. Thus, the stocks of external assets rather than the flows are consistent with the model. But the choice of the stock at time t may need to use the information set conveyed in the stock at time $t-1$. Therefore, empirically, we may need to allow for the lagged dependent variable in the equation to control for the dynamics of the information set.

correlated with ε_{it}, and thus create an endogeneity problem. To correct this problem, we will then use the Arellano-Bond dynamic GMM

approach to estimate equation (15).

3.3 Probability of Liquidity Crisis

The crux of our theory is that a higher probability of an aggregate liquidity shock (the variable q) increases the share of FPI, relative to FDI.

Therefore we include in equation (14) a variable, $\Pr_{i,t}(Liquidity\ Shock_{i,t+1})$, to proxy for this probability, as perceived in period t.[2]

We emphasize that we look at the probability of such a shock to occur irrespective of whether such a shock actually occurs.

We define the liquidity crisis as an episode of negative purchase of external assets. The intuition is that economy wide liquidity crises in source

[2] The inclusion of the liquidity shock probability is in the spirit of Razin and Rubinstein (2006), where they stress the importance of including the probability of currency crisis in estimating the relationship between exchange rate regime and economic growth.

countries will generate a sale of many types of external assets, such as foreign reserves, loans and equities. Hence negative purchase of external

assets can be a reasonable proxy of liquidity crises. The flow data on external assets is from the International Financial Statistics's Balance of

Payments dataset, where assets include FDI, FPI, other investments and foreign reserves. We thus define the liquidity crisis episodes as sales of

external assets, which has a frequency of 13% in our sample of 140 countries from 1985 to 2004.

Probit model:

$$I_{i,t}\left(Liquidity\ Crisis_{i,t+1}\right) = \begin{cases} 1 & \text{if } \ y^*_{i,t+1} > 0 \\ 0 & \text{if } \ y^*_{i,t+1} \leq 0 \end{cases},$$

where $y^*_{i,t+1}$, a latent variable, is a function of the following independent variables:

$$\mathbf{y}^*_{i,t+1} = \mathbf{Z}'_{it}\boldsymbol{\lambda} + \boldsymbol{\eta}_{i,t+1}, \tag{16}$$

where $\eta_{i,t+1}$ follows a standard normal distribution.

The vector Z'_{it} is motivated by the literature on financial crises (e.g., Frankel and Rose, 1996). It covers control variables from equation

(14): the log of population, the log of GDP per capita, trade openness, and stock market development. Moreover, it also includes US

real interest rate, source country political risk index, current account surplus over GDP or budget balance over GDP or Standard & Poor's

sovereign debt rating. Political risk index, from the International Country Risk Guide, is based mainly on government stability, socioeconomic

conditions, investment profile, internal conflict, external conflict, corruption, and bureaucracy quality.

To identify β in equation (14), the exclusion restriction needs to be satisfied. That is, there needs to be at least one variable that is

correlated with $y^*_{i,t+1}$ in equation (16) but uncorrelated with ε_{it} in equation (14). We argue the following variables can satisfy the

exclusion restriction: political risk index, current account surplus over GDP, and budget surplus over GDP. Our theory does not suggest their

inclusion in equation (14). And we are not aware of other models where they directly influence the composition of capital outflows.

Because of frictions in control that exist in FDI but not in FPI, wealth is important only for FDI. Thus a rise in host-country wealth, from the

appreciation of its real exchange rate, will increase its FDI inflow, while having no impact on its FPI receipts. One could potentially extend

their model to source countries with the prediction that real exchange rate appreciation may increase FDI outflow, relative to FPI outflow.

Hence we will include a control variable for the wealth effect in equation (14), i.e., the lagged real exchange rate appreciation.[3]

With the wealth effect controlled for, there is unlikely to be a correlation between ε_{it} and current account or budget surplus, and β can be

unbiasly estimated.

4 Empirical Findings

4.1 Probit

Table 3 presents the Probit estimations. Case1 (Column 1) examines all countries from 1985 to 2004, subject to data availability on control

[3] We will examine it in more details in the section on sensitivity tests.

variables. We find that larger economic size, higher development level, and trade openness all lower the occurrence of liquidity crises.

Meanwhile, higher U.S. interest rate, higher political risk and smaller current account surplus increase the probability of crises. The

predicted crisis probability ranges between 0.01 and 0.57, with an average of 0.19.

In Case 2, we focus on countries with stock markets, which are the main players behind foreign portfolio investments. This shrinks our sample

size by 45%. Still we find similar results as in Column 1. The predicted crisis probability now ranges from 0.01 to 0.77, with an average of

0.11. In Case 3, we substitute the current account surplus on the external side with the budget surplus on the domestic side. We find that higher

budget surplus is associated with smaller probability of crisis. In Column 4, we use the Standard and Poor's sovereign rating instead. When the

sovereign rating is poor, government, banks and non–financial firms will find it more expensive to borrow abroad and therefore compete for

domestic resources, creating upward pressure on interest rates. The inclusion of sovereign rating reduces the sample size by 30%, owing to the

smaller country coverage. We find that higher sovereign rating significantly reduces the likelihood of crisis.

4.2 Ratio of FPI to FDI

With the predicted crisis probabilities from Table 3, we can now estimate equations (14) and (15). The results are reported in

Table 4. Columns 1 and 2 present the estimations with pure country fixed effects (i.e., no dynamic feedback). We start with the predicted

probability as the only explanatory variable. As our theory predicts, a higher probability of liquidity shocks significantly increases the share of

FPI outflow relative to FDI. A 1% rise of the crisis probability will increase the ratio of FPI stock over FDI stock by 3%. Column 2, with

more control variables, confirm the results in Column 1. It also suggests that trade openness complements FDI outflow.

Columns 3 and 4 report dynamic panel estimations. Dynamic estimation reduces the sample size, but reassuringly, higher probability of

liquidity shocks still increases FPI relative to FDI. We also find that the lagged FPI/FDI ratio is associated with the current FPI/FDI ratio. The

coefficient of the lagged FPI/FDI is 0.73, which suggests that there is no panel unit root process for ln(FPI/FDI). Additional Arellano-Bond

tests fail to reject the hypothesis of no second-order autocorrelation. That is, the estimations in Columns 3 and 4 are valid estimations To

examine whether there is nonlinearity, we also add the square of the predicted probability as an additional explanatory variable. The square term

is not significant in either the pure fixed effect estimation or the dynamic panel estimation.

The above results could also be consistent with models that are not based on information asymmetry but on pure transaction cost or market

depth. FPI tends to be easier to liquidate than FDI. For example, to liquidate FDI, it may take longer to find buyers who know the sectors and

are willing to take over the management. But to liquidate FPI, it will not be difficult to sell stocks to other portfolio investors in a deep stock

market. If an investor foresees a liquidity crisis and the need to liquidate assets, he may then choose FPI instead. This argument is based on pure

transaction cost without involving information asymmetry. As our theoretical model is based on asymmetric information, we have a second

layer of testable predictions that the above counter arguments lack. That is, liquidity shocks will interact with source-country capital market

transparency to influence the FPI/FDI composition. We now test this prediction.

4.3 Capital Market Opacity in Source Country

$$\ln(FPI/FDI)_{it} = \phi \ln(FPI/FDI)_{i,t-1} + \alpha X_{it} + \beta_0 \Pr_{i,t}(Liquidity\ Shock_{i,t+1}) + \beta_1 Opacity_i * \Pr_{i,t}(Liquidity\ Shock_{i,t+1}) + \gamma Year_t + u_i + \varepsilon_{it} \quad (17)$$

We expect to see a positive value of β_1. Note that the opacity index itself is excluded as an explanatory variable, as it is time-invariant and

therefore imbedded in country fixed effects. In this section, we focus on countries where stock markets are present, hence our Probit prediction

of crisis is based on the coefficients in Case 2 of Table 3, although results were similar if based on Case 1 of Table 3.

In our theoretical model, the opacity is related to either the fundamentals of the project or the liquidity situation of investors. We now

introduce a rich set of indexes that capture the degree of opacity about investors' liquidity, and to some extent, the underlying projects. We start

with the disclosure score from Center for International Financial Analysis and Research (1995), which examines firm-level annual reports for

the omission or inclusion of 90 accounting items in 41 countries for the year of 1993. The score is related to firm's incomes, cash flows and

balance sheets, which cover firm's liquidity and operations. It ranges from 56 to 85, with higher score associated with better corporate

disclosure. It has been applied in prior studies (La Porta et al. (1998), Rajan and Zingales (1998), and Bushman, Piotroski and Smith (2004)).

We use 100 minus the original CIFAR transparency index to arrive at the CIFAR opacity index (Table 1), and apply it in equation

(17). Again we estimate both the pure fixed-effect model and the dynamic panel. We find that the interaction term of opacity and crisis

probability has a positive coefficient (Columns 1 and 2 of Table 5), hence higher opacity increases the effect of crisis probability on the

FPI/FDI composition.

Our second opacity index comes from Kurtzman, Yago and Phumiwasana (2004), which follows the methodology of PricewaterhouseCoopers

(2001) Opacity Index but expands the country coverage from 35 to 48. The index measures opacity based on five standards-related

dimensions– corruption, efficacy of the legal system, deleterious economic policy, inadequate accounting and governance practices, and

detrimental regulatory structures. We use both its overall opacity index (OPA) and its accounting subcomponent (ACC), with higher index

associated with lower transparency (Table 2).The original PricewaterhouseCoopers 2001 Opacity Index has been applied in Gelos and Wei

(2005), where the authors study how host country transparency affects international investors' portfolio holdings. We report the estimation of

equation (17) with the accounting opacity index in Columns 3 and 4 of Table 5, and with the overall opacity in Columns 5 and 6. All

the estimations suggest that higher opacity strengthens the effect of the crisis probability on the FPI/FDI choice.

Our fourth proxy of opacity is from the Global Competitiveness Report (1999) published by the World Economic Forum. The Report surveys

over 3,000 executives about their perceptions of the firm-level financial disclosure in the country where they operate. The respondents were

asked to assess the validity of the statement "The level of financial disclosure required is extensive and detailed" with a score from 1 (strongly

disagree) to 7 (strongly agree) for 58 countries. We use 8 minus the original value to construct our proxy of opacity (GCR, Table 3). This

proxy for corporate opacity has also been applied previously in Gelos and Wei (2005). The regression results in Columns 7 and 8 of Table 5

again suggest that opacity increases the impact of the predicted liquidity crisis.

Hence, we confirm the importance of the interplay of asymmetry information and liquidity shocks on the capital flow composition by applying

a rich set of opacity proxies. Certainly, those proxies are correlated, even though they are based on different years and criteria (subjective or

objective). Appendix 4 list the correlations among them, with the correlations ranging from 0.24 to 0.78.

So far, the predicted probability of crisis is based on the Probit estimation in Column 2 of Table 3. Now, we use an alternative prediction of

crisis probability based on Column 3 of Table 3, where we replace current account surplus with budget surplus in the Probit equation. The

regression results with the new crisis probability are reported in Table 6. Reassuringly, the pattern of results in Table 5 still carry over, with

similar signs and significance levels. We further apply another measure of crisis probability based on Column 4 of Table 3, where Standard and

Poor's sovereign rating replaces current account surplus. The new results are reported in Table 7. The average sample size now is around 15%

less than that in Table 5. But again, we find significant impacts of opacity, similar to those in Table 5. Hence, these alternative crisis

probabilities assure us that our key results related to liquidity and opacity are not driven by a certain functional form or specification of the

Probit.

4.4 More Sensitivity Checks

In this section, we look at several variations of the panel estimation of equation (17). We start with adding more variables into

equation (17) to tackle potential omitted variable problems. Our first addition is a variable controlling for the effect of wealth on FDI.

According to Froot and Stein (1991), and Baker, Foley, and Wurgler (2007), higher source country's wealth could significantly boost FDI

outflow, as it provides cheaper financing. Froot and Stein (1991) use the appreciation of exchange rate to proxy for cheaper financing, while

Baker, Foley, and Wurgler (2007) use the stock market's market to book ratio. As the data on exchange rate has more country coverage than

the market/book ratio, we will then use the real exchange rate to proxy for the wealth of source country. We reexamine Table 5 and report the

new results in Table 8. The sample size is now reduced by around 10% in some cases. We find that the appreciation of the real exchange rate

increases the FDI more than for the FPI, consistent with Froot and Stein (1991). More importantly, our key results on liquidity and opacity is

still present. We also add the lagged real exchange rate appreciation into the Probit estimation of crisis, but it turns out to be insignificant.

Another control variable we add is the Chinn and Ito (2007) measure of financial openness. We do not find a significant effect for it on either

the crisis probability or the FPI/FDI composition.

Secondly, we have so far excluded opacity itself as an explanatory variable, because time-invariant opacity indicators are already imbedded in

country fixed effects. As a sensitivity check, we drop country fixed effects and add opacity indexes as control variables. We find that the

interaction term of opacity and crisis probability is still positive for all opacity indexes, and is different from zero at the 5% level for two

indexes (OPA and GCR).

Thirdly, we substitute the predicted probability of crisis with the actual occurrence of liquidity crisis at $t+1$. Evidently, this may create some

endogeneity issues in estimation. But it can still serve as useful checks, particularly if there is some concerns about the forecasting power of

Probit models. The dynamic panel estimation results are presented in Table 9, with four proxies of opacity (OPA, ACC, CIFAR, and GCR).

Again, there we find that the occurrence of liquidity crises at $t+1$ increases the ratio of FPI to FDI. Moreover, the impact becomes larger for

source countries with opaque capital markets.

Finally, we use the one-year lags of FPI stock (log) and FDI stock (log) as explanatory variables, rather than the lag of the FPI/FDI ratio. We

find that the lagged FPI is positively associated with the FPI/FDI ratio, while the lagged FDI is negatively associated with the FPI/FDI ratio.

More importantly, the probability of crises still has significant impacts as in Table 5.

5 Conclusion

A key prediction then is that countries that have a high probability of an aggregate liquidity crisis will be

the source of more FPI and less FDI. Another prediction is that this effect will be strong only when the

transparency in the source country is weak.

To test this hypothesis, we apply a dynamic panel model to examine the variation of FPI relative to FDI

for 140 source countries from 1990 to 2004. We use episodes of negative purchase of external assets as a

proxy for liquidity crises. Using a Probit specification, we estimate the probability of liquidity crises for

each country and in every year of our sample. Then, we test the effect of this probability on the ratio

between FPI and FDI generated by the source country. We find strong support for our model: a higher

probability of a liquidity crisis, measured by the probability of episodes of negative purchase of external

assets, has a significant positive effect on the ratio between FPI and FDI. Moreover, higher opacity in the

source country accelerates the effect of the probability of liquidity shock on FPI/FDI. Hence, liquidity

shocks seem to have strong effects on the composition of foreign investment, as predicted by our model.