Korea and the World Economy, Vol. 16, No. 3 (December 2015) 311-344

Financial Risk and Cross-border M&A*

Badassa Wolteji Chala** · Kazunobu Hayakawa*** · Hyun-Hoon Lee****

This paper assesses the question of how a host country's financial risk influences cross-border Merger and Acquisition (M&A). We use bilateral flows of cross-border M&A from 20 major Organization for Economic Cooperation and Development (OECD) countries to 135 developed and developing countries for the period 1995-2012. Utilizing a partial adjustment model that includes the initial levels of and differences in explanatory variables, we investigate the long-term vs. short-term effects of financial risk on cross-border M&A. We also employ the Heckman sample selection model to assess the long-term vs. short-term effects of financial risk on two different stages of cross-border M&A (i.e., selection stage vs. outcome stage). We find that financial risk is quite different from political risk, as with regards to its association with cross-border M&A. Specifically, while higher political risk in developing countries is associated with lower cross-border M&A sales, higher financial risk of host countries, particularly of developing countries, is associated with greater M&A sales, not only in the short term but also in the long term. Among the various components comprising financial risk, exchange rate instability, debt service as % of exports, current account as % of GDP, and international liquidity are found to be significant where the host country is a developing country.

* Received October 7, 2015. Revised November 11, 2015. Accepted November 20, 2015. An earlier version of this paper was written while Professor Lee was Visiting Professor at the Sauder School of Business, University of British Columbia, Canada. We are grateful to John Ries and the two referees for their very useful comments. This work was supported by the National Research Foundation of Korea Grant funded by the Korean Government (NRF-2014S1A5A2A01013361).

** Department of International Trade and Business, Kangwon National University, 1 Kangwondaehak-gil, Chuncheon-si, Gangwon-do, 24341, Korea, E-mail: badassa@kangwon.ac.kr

*** Institute of Developing Economies, Japan External Trade Organization, Chiba-shi, Chiba 261-8545, Japan, E-mail: kazunobu_hayakawa@ide-jetro.org

**** Author for Correspondence, Professor, Faculty of Economics and International Trade, Kangwon National University, 1 Kangwondaehak-gil, Chuncheon-si, Gangwon-do, 24341, Korea, E-mail: hhlee@kangwon.ac.kr

JEL Classifications: F21, F23, G15, G32, G34
Keywords: cross-border M&A, political risk, financial risk

1. INTRODUCTION

Although Foreign Direct Investment (FDI) offers ample opportunities for profit-seeking multinational enterprises (MNEs), this involves greater risks than trade as it utilizes transfer of resources to foreign countries. The riskier nature of FDI, as compared with international trade, is well reflected in the trends of FDI flows, that have shown more drastic ups and downs globally, regionally, and nationally.

Many studies have analyzed the question of how country risk influences FDI flows. Earlier studies include Edwards (1992), Schneider and Frey (1985), and Busse and Hefeker (2007), which claim that a host country's high political risk deters FDI flows. While most papers have considered political (or institutional) risk as the main country risk factor in influencing FDI inflows, financial risk, in terms of the country's ability to repay its liabilities, can also be an important factor. However, Hayakawa *et al*. (2013), using overall FDI inflows to 89 developing countries for the period 1985-2007, reveal that while high political risk deters FDI inflows, high financial risk does not deter FDI inflows into these countries. Lee and Rajan (2011) also find a similar result among the APEC economies during 1998-2007.

The main reason for the ambiguous effects of financial risk in the study by Hayakawa *et al*. (2013) may be the fact that FDI includes both greenfield investment (construction of new facilities) and cross-border merger and acquisition (M&A) flows that might respond differently to financial risk of host countries. Indeed, Byun *et al*. (2012) find that while the financial risk of host emerging countries has a negative association with greenfield FDI, it has a positive association with M&A, suggesting that countries with greater financial risk tend to have a greater amount of M&A sales.[1)] Their results

[1)] MNEs' choice of greenfield vs. M&A has been studied empirically by many researchers (e.g., Kogut and Singh, 1988; Globerman and Shapiro, 2004; Neto *et al*., 2010). There are

are based on a panel dataset for 40 emerging host countries covering the period 1990-2009. Dailami *et al*. (2012) also find a similar result for developing source countries. Relying on bilateral outbound cross-border M&A data for firms based in 61 emerging economies, collected for the period between 1997 and 2010, they find that emerging economy acquirers tend to seek out targets in advanced economies that exhibit lower levels of political risk but higher levels of financial risk.

In a similar way to Byun *et al*. (2012) and Dailami *et al*. (2012), this paper aims to assess whether higher financial risk of host countries results in a greater amount of cross-border M&A sales. However, this paper differs from these two studies in a number of dimensions. First, using a bilateral panel dataset for the cross-border M&A flows from 20 major Organization for Economic Cooperation and Development (OECD) countries to 142135 developed and developing countries for the period 1995-2012, this paper assesses whether financial risk has a different effect on cross-border M&A, depending upon the income level of the host countries. Second, modelling partial adjustment by including the initial levels of and differences in explanatory variables in a regression specification, this paper assesses the long-term vs. short-term effects of financial risk on cross-border M&A. Third, by utilizing the Heckman sample selection model, this paper also assesses the long-term vs. short-term effects of financial risk on two different stages of cross-border M&A (i.e., selection stage vs. outcome stage).

We find that while higher political risk in developing countries is associated with lower cross-border M&A sales, higher financial risk in developing countries is associated with greater M&A sales, not only in the long term but also in the short term. Among the various components comprising financial risk, exchange rate instability, debt service as % of exports, current account as % of GDP, and international liquidity are found to be significant where the host country is a developing country.

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also some theoretical models to explain the differences between cross-border M&A and greenfield FDI (e.g., Nocke and Yeaple, 2007 and 2008; Stepanok, 2015). None of these studies, however, examines how financial risk is related to different entry modes of FDI.

The remaining part of the present paper is organized as follows. Section 2 explains details of our estimation strategy utilizing a gravity equation in the partial adjustment model and the Heckman sample selection model. Section 3 describes the data, section 4 presents our empirical results, and section 5 offers a summary and concluding remarks.

2. ESTIMATION STRATEGY

2.1. The Basic Equation

Following the insight of Newton's Law of Gravity, bilateral M&A flows can take the form:

$$MA_{ijt} = \beta_0 + \beta_1 Risk_{it} + \beta_2 X_{it} + \beta_3 X_{jt} + \beta_4 X_{ij} + \varepsilon_i + \varepsilon_j + \varepsilon_t + \varepsilon_{ijt}, \qquad (1)$$

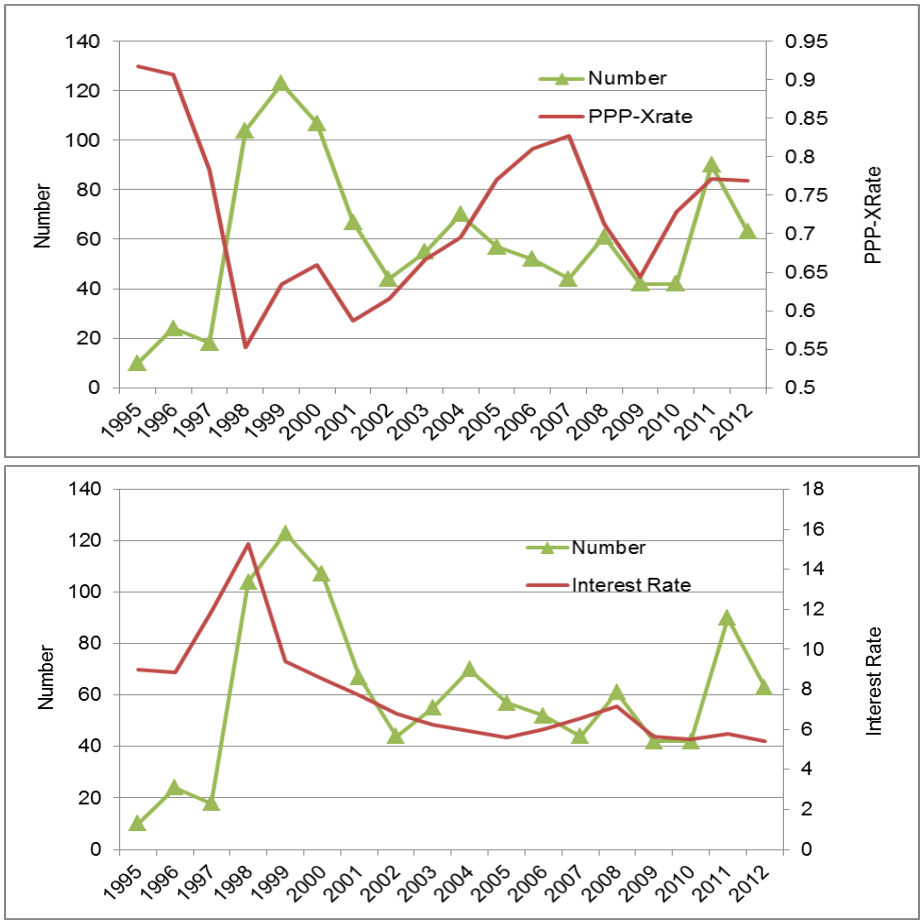
where MA_{ijt} is log of cross-border M&A sales from country i to country j in year t, $Risk_{it}$ represents country risk indices (political and financial) of country i in year t, while X_{it}, X_{jt}, and X_{ij} stand for source, host, and bilateral variables. The β's are parameters to be estimated and ε_{ijt} is the error term. Source and partner fixed effects as well as year fixed effects (ε_i, ε_j, and ε_t) are included.[2)]

Note that equation (1) allows us to evaluate long-term, structural adjustments of cross-border M&A in response to changes in financial risk of potential host countries. However, we are also interested in the 'short-term' surge in foreign acquisitions of local firms during a financial crisis, so as to be able to evaluate the 'fire-sale' argument which was first advocated by Krugman (2000). One fire-sale explanation is that financial risk that is manifested in a weaker currency lowers the cost of acquisition in terms of

[2)] Following Anderson and van Wincoop (2003), Kleinert and Toubal (2010) also obtained multilateral resistance terms in a theoretical gravity model for FDI. Head and Ries (2008) also develop a gravity model for cross-border M&A. We do not include country-year fixed effects because our focus variables, political risk and financial risk, are time variant.

foreign currency. Another fire-sale explanation arises when risk is associated with liquidity constraints in the host country that can be eased with foreign acquisition (Aguiar and Gopinath, 2005).[3] These two explanations can be

Figure 1 Trend of Cross-border M&As, Real Exchange Rates, and Interest Rates in Korea during 1995-2012



Source: Compiled by the authors using Thomson Reuters SDC Platinum Database (M&A) and World Bank's World Development Indicators Database (ppp-exchange rate and interest rate).

[3] Acharya *et al*. (2011) show theoretically that during a financial crisis there is a transfer of ownership to foreign firms at fire-sale prices and these stakes are subsequently re-sold to local investors once the crisis abates.

supported by looking at the case of Korea, which suffered a sudden financial crisis in 1997-1998. As seen in figure 1, during the financial crisis period, Korea's purchasing power parity (PPP) exchange rate[4] dropped drastically while the interest rate[5] skyrocketed. There was also a surge in the number of cross-border M&A deals during the crisis period, roughly with a one-year lag.[6]

Therefore, the above gravity equation will be extended by utilizing a partial adjustment specification which differentiates the short-term and long-term adjustments of M&A in response to changes in the host country's financial risk, in a similar way to Lee *et al*. (2008) and Hayakawa *et al*. (2013). Suppose that the desired level of cross-border M&A between country *i* and country *j* at time *t* is MA_{ijt}^{*}; then, the relationship between the actual and the desired level of MA_{ijt} can be specified as follows:

$$dMA_{ijt} = \delta(MA_{ijt}^{*} - MA_{ijt-1}), \tag{2}$$

where δ is the rate of adjustment and is bounded by zero and one. Because MA_{ijt}^{*} is not observed, several formulations are possible. One formulation assumes that MA_{ijt}^{*} is determined by the levels of the determinants of MA_{ij} in period *t*–1, as well as the differences (which incorporate changes in the long-

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[4] Precisely, this is called the PPP conversion factor (GDP) to market exchange rate ratio, obtained from World Bank's World Development Indicators (WDI). The purchasing power parity conversion factor is the number of units of a country's currency required to buy the same amount of goods and services in the domestic market as a U.S. dollar would buy in the United States. The ratio of PPP conversion factor to market exchange rate is the result obtained by dividing the PPP conversion factor by the market exchange rate. This ratio, also referred to as the national price level, makes it possible to compare the cost of the bundle of goods that make up the gross domestic product (GDP) across countries. It tells how many dollars are needed to buy a dollar's worth of goods in the country, as compared with the United States. PPP conversion factors are based on the 2011 ICP round (World Bank, World Development Indicators).

[5] Nominal lending interest rate drawn from WDI.

[6] For a rigorous study on the determinants of international capital flows in Korea, the reader is referred to Kim *et al*. (2013), who compare portfolio investment and foreign direct investment. However, they do not distinguish cross-border M&A from greenfield investment. The reader is also referred to Harvie and Lee (2003) and Huh and Nam (2010) for a review of Korea's financial crisis in 1997-1998.

run extent of MA_{ij} between period t–1 and t). Thus, the equation for changes in MA_{ij} is:

$$dMA_{ijt} = -\delta MA_{ijt-1} + \lambda_1 Z_{t-1} + \lambda_2 dZ_t, \tag{3}$$

where Z is a vector of explanatory variables and $dZ_t = (Z_t - Z_{t-1})$.

A special case of equation (3) is found where $\lambda_1 = \lambda_2$ and hence MA^*_{ijt} is determined only by the level variables in period t and the lagged value of MA_{ij}. This specification embodies the assumption that changes in the determinants of MA_{ij} are correctly anticipated and fully reflected in the current MA_{ij}. In this instance, equation (3) becomes:

$$dMA_{ijt} = -\delta MA_{ijt-1} + \lambda_1 Z_t. \tag{4}$$

Thus, the usual partial adjustment model specified as equation (4) is a special case of equation (3).[7)]

On incorporating equation (1) into equation (3), we have the following equation:[8)]

$$\begin{aligned} dMA_{ijt} = {} & \delta MA_{ijt-1} + \beta_{11} Risk_{it-1} + \beta_{21} X_{it-1} + \beta_{31} X_{jt-1} + \beta_{41} X_{ijt-1} \\ & + \beta_{12} dRisk_{it} + \beta_{22} dX_{it} + \beta_{32} X_{jt} + \beta_{42} dX_{ijt} + \varepsilon_{ijt}. \end{aligned} \tag{5}$$

If the coefficients in equation (5) are invariant to the choice of time period (which is obtained at equilibrium with constant coefficients) and if the error terms between t and t–1 are not correlated, then the β coefficient on each level variable divided by the rate of adjustment parameter (δ) equals the

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7) Formally, we can evaluate the dynamic structure by first estimating equation (4) and then testing the null hypothesis that the first-differenced variables have no significant effect (i.e., $\lambda_2 = 0$). If the null hypothesis is not rejected, we then test the hypothesis that the coefficients for the levels and changes are equal (i.e., $\lambda_1 = \lambda_2$). If this second null hypothesis is not rejected, we then estimate equation (4).

8) The reader is referred to Hayakawa *et al*. (2013) for more detailed rationale for this specification.

corresponding long-run coefficient. The β coefficients on the first-difference variables represent the short-run adjustments to contemporaneous changes in the determinants of *MA*.

Thus, equation (5) allows us to assess how the annual changes in cross-border M&A sales are associated with annual changes in country risk of host countries as well as the initial level of country risk of host countries.[9] Another advantage of using the partial adjustment specification, as shown in equation (2), is that by first differencing the data, we can control for the time-invariant characteristics of source and host countries as well as country pairs.

In addition, note that equation (5) can also be written as:

$$\begin{aligned} dMA_{ijt} = (1-\delta)MA_{ijt-1} + \beta_{11}Risk_{it-1} + \beta_{21}X_{it-1} + \beta_{31}X_{jt-1} \\ + \beta_{41}X_{ijt-1} + \beta_{12}dRisk_{it} + \beta_{22}dX_{it} + \beta_{32}X_{jt} + \beta_{42}dX_{ijt} + \varepsilon_{ijt}. \end{aligned} \tag{6}$$

2.2. Two Econometric Procedures

In all regressions, the dependent variable is the number of cross-border M&A deals.[10] One of the main issues in using cross-border M&A as the dependent variable is the presence of a large number of zero flows. Seventy-two percent of our dataset contains many zero observations. Many pairs of countries with zero reported flows of cross-border M&A could indicate measurement errors or true zeros, perhaps situations where fixed costs exceed expected variable profits (Razin *et al*., 2004 and Davies and Kristjánsdóttir, 2010). When the gravity equation, as shown in equation (1), is estimated in a log-linear form, it is not possible to include observations where reported M&A is zero. Two solutions have recently been proposed: Santos Silva and Tenreyro (2006) propose a Poisson Pseudo-Maximum-

[9] It is also noted that by including the lagged dependent variable, we can capture the clustering effects of FDI — a larger FDI flowing from a source country to a host country in the previous period may be seen by the MNEs of the same source country as a signal of a benign business climate for foreign investors.

[10] We do not use the value of cross-border M&A deals because this is not available in respect of many country pairs for reasons of confidentiality.

Likelihood (PPML) estimator, while Helpman *et al*. (2008) propose a modified Heckman Selection model. We will estimate equation (6) under these alternative econometric procedures.

2.2.1. Poisson Pseudo-Maximum-Likelihood (PPML) estimator

Santos Silva and Tenreyro (2006) argue that estimating a log-linearized gravity equation by OLS results in bias. Their argument is based on the fact that $E[\ln(y)] \neq E[y]$. That is, the expected value of the logarithm of a random variable is different from the logarithm of its expected value. They also contend that when the dependent variable takes the value of zero, it would automatically be dropped, thus resulting in sample selection bias. Even when the dependent variable is positive, the expected value of the log-linear error would often depend on the explanatory variables, and OLS is inconsistent in the presence of heteroskedasticity, which is highly probable in practice.

They show that the Poisson Pseudo-Maximum-Likelihood (PPML) estimator provides consistent estimates of the gravity model as estimated in its multiplicative form:

$$y_i = \exp(x_i\beta) + \varepsilon_i, \tag{7}$$

where y_i is a dependent variable with a non-negative value and $E[\varepsilon_i | x] = 0$.

Therefore, as in Coeurdacier *et al*. (2009), we employ the PPML estimator to estimate equation (6) without taking the log of M&A sales. One obvious advantage of utilizing PPML in our study is that the zero-valued observations are naturally included.

2.2.2. Heckman sample selection estimator

Following Razin *et al*. (2004), MNEs' overseas investment decisions can be considered as two-stage decision processes where they make a decision to invest or not (selection stage) and then decide how much they will actually invest (outcome stage). Therefore, we need to apply an appropriate

econometric technique that accounts for the interdependence of the two stages, thereby avoiding any possible bias resulting from estimating them separately. In this context, Heckman sample selection is a suitable estimator.

We formulate the two equations (selection and outcome, respectively) as follows:

(equation for positive M&A flows)

$$MA_{ijt}^{*} = (1-\delta)MA_{ijt-1} + \beta_{11}Risk_{it-1} + \beta_{21}X_{it-1} + \beta_{31}X_{jt-1} + \beta_{41}X_{ijt-1} + \beta_{12}dRisk_{it} + \beta_{22}dX_{it} + \beta_{32}X_{jt} + \beta_{42}dX_{ijt} + \varepsilon_{ijt}. \quad (8)$$

(equation for M&A decision)

$$PD_{ijt}^{*} = (1-\theta)PD_{ijt-1} + \gamma_{11}Risk_{it-1} + \gamma_{21}X_{it-1} + \gamma_{31}X_{jt-1} + \gamma_{41}X_{ijt-1} + \gamma_{12}dRisk_{it} + \gamma_{22}dX_{it} + \gamma_{32}X_{jt} + \gamma_{42}dX_{ijt} + \mu_{ijt}. \quad (9)$$

with

$$\left.\begin{aligned} MA_{ijt} &= MA_{ijt}^{*} \quad \text{if } PD_{ijt}^{*} = 1 \\ MA_{ijt}^{*} &= 0 \qquad \text{if } PD_{ijt}^{*} = 0 \end{aligned}\right\}$$

and

$$\left.\begin{aligned} PD_{ijt} &= 1 \ \text{ if } PD_{ijt}^{*} > 0 \\ PD_{ijt} &= 0 \ \text{ if } PD_{ijt}^{*} \le 0 \end{aligned}\right\}$$

Equation (8) describes how much a source country i actually invests in a host country j in year t and is estimated by maximum likelihood (ML). Equation (9) describes the source country's participation decision on whether or not to invest in a host country j and hence is estimated by the Probit estimator. Thus, the M&A sales are zero ($MA_{ijt} = 0$) when the source

country decides not to invest ($PD_{ijt}^{*} = 0$): the M&A flows assume positive values ($MA_{ijt} = MA_{ijt}^{*}$) when the source country decides to invest ($PD_{ijt}^{*} = 1$). The two error terms ε_{ijt} and μ_{ijt} are assumed to be bivariate normal and correlated and the two equations are simultaneously estimated.

Although both PPML and Heckman sample selection estimators are widely used in estimating a gravity model, both do indeed have their own merits and demerits. For example, while PPML deals well with heteroskedasticity, Heckman does not (Shepherd, 2013). While Heckman allows for separate data-generating processes for zero and non-zero observations, PPML assumes that all observations are drawn from the same distributions. On account of this, we report both PPML and Heckman sample selection estimators in order to enhance the robustness of our results.

3. THE DATA

3.1. Cross-border M&A Data

As the dependent variable we use bilateral flows of cross-border M&A from 20 major OECD countries to 135 developed and developing economies (for which data are available) for the period 1995-2012.[11] Our cross-border M&A data are drawn from the Thomson-Reuters SDC Platinum Database.

Table 1 summaries the total number and US$ value of cross-border M&A deals during the period 1995-2012 conducted by the 34 OECD countries. During this period, over 95% of cross-border M&A deals were made by the 20 major countries.[12] Among these 20 countries, there are quite large variations,

[11] These comprise 31 OECD countries, 18 high-income non-OECD countries, 36 upper middle-income countries, 30 lower middle-income countries, and 20 low-income countries (Defined by the World Bank as of 2012). Throughout the paper, the 31 OECD and 18 high-income non-OECD countries are referred to as 'high-income countries', whereas the remaining 90 countries (37+30+23) are referred to as 'developing countries'. The full list of countries is in the Appendix table.

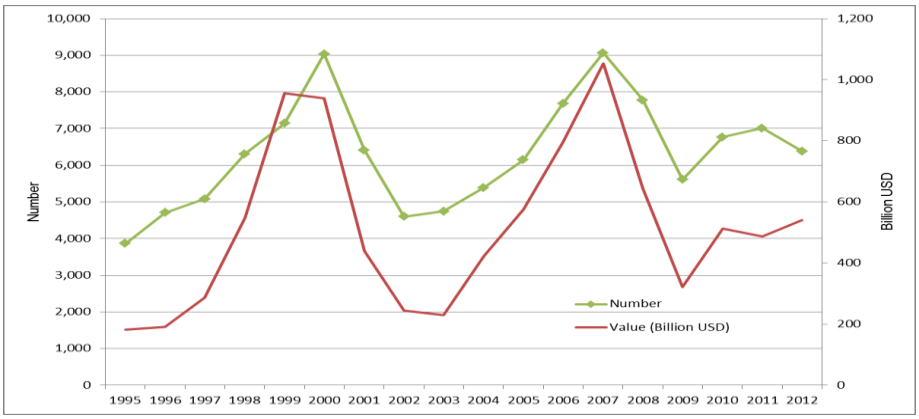
[12] United States, United Kingdom, Canada, Germany, France, Netherlands, Australia, Sweden, Japan, Switzerland, Spain, Italy, Belgium, Denmark, Finland, Austria, Norway, Ireland, Luxembourg, and South Korea.

Table 1 Cross-border M&A by OECD Members during 1995-2012

	Country	Number	Value (Million USD)
1	United States	31,417	2,100,464.9
2	United Kingdom	15,533	1,762,224.3
3	Canada	10,840	545,375.0
4	Germany	8,339	757,671.0
5	France	7,390	928,803.0
6	Netherlands	5,818	591,586.0
7	Australia	4,471	304,403.0
8	Sweden	4,401	199,653.0
9	Japan	4,355	346,417.0
10	Switzerland	4,012	456,921.0
11	Spain	2,503	424,156.0
12	Italy	2,396	264,169.0
13	Belgium	2,249	226,990.0
14	Denmark	2,022	72,007.4
15	Finland	1,963	94,381.4
16	Austria	1,939	61,533.7
17	Norway	1,908	97,423.4
18	Ireland	1,638	76,224.9
19	Luxembourg	1,200	109,564.0
20	South Korea	1,134	73,703.2
21	Israel	790	60,544.3
22	New Zealand	643	33,423.1
23	Greece	552	26,186.4
24	Portugal	501	33,123.3
25	Mexico	459	60,909.9
26	Poland	391	13,214.6
27	Iceland	349	18,953.6
28	Chile	308	25,836.8
29	Czech Republic	264	8,006.7
30	Hungary	211	6,051.1
31	Turkey	201	9,440.6
32	Estonia	165	805.6
33	Slovenia	145	1,298.7
34	Slovak	85	2,707.0
Top 5 Countries Total		73,519 (61.0%)	6,094,538.2 (62.2%)
Top 10 Countries Total		96,576 (80.1%)	7,993,518.2 (81.6%)
Top 20 Countries Total		115,528 (95.9%)	9,493,671.2 (96.9%)
34 Ccountries Total		120,592 (100%)	9,794,172.9 (100%)

Source: Authors' calculation using Thomson Reuters SDC Platinum Database.

Figure 2 Trend of Cross-border M&As by 20 OECD Members during 1995-2012



Source: Compiled by the authors using Thomson Reuters SDC Platinum Database.

with the United States being ranked first in terms of both the number and value of cross-border M&As during the period.

Figure 2 displays the trend of the cross-border M&A sales made by the 20 OECD member countries during the period 1995-2012. The cross-border M&A increased in terms of its number and value, but with high volatility. In particular, there were drastic ups and downs in the late 1990s/early 2000s and in the late 2000s, with peaks at 9,031 deals (valued US$ 940 billion) in 2000 and 9,060 deals (valued US$ 1,053 billion) in 2007, respectively.

3.2. Explanatory Variables

3.2.1. Country risk variables

As discussed in the Introduction section, host countries provide market opportunities, low operating costs, and access to natural resources for MNEs. However, host countries are not risk-free. Two types of country risk of host countries, namely, political and financial risk, are likely to affect FDI flows.

Basically, political risk occurs because of changes in leaders' opinions and policies, civil disorder, and hostility between source and host countries or enmity between host and other countries. Such scenarios could cost

companies extra resources, since their invested assets might be destroyed or frozen. Changes in a host country's policies can also lead to extra costs for adjustment to the new policies. Financial risk is mainly related to ability to move funds out of host countries and to changes in exchange rates.

Our country risk data are drawn from the PRC Group's International Country Risk Guide (ICRG) rating that comprises 22 different variables, grouped as a political, financial, and economic rating.[13] The political risk rating comprises 12 sub-indices: Government stability, Socioeconomic conditions, Investment profile, Internal conflict, External conflict, Corruption, Military in politics, Religious tensions, Law and order, Ethnic tensions, Democratic accountability, and Bureaucracy quality. The financial risk rating is composed of five sub-indices: Foreign debt as a percentage of GDP, Foreign debt service as a percentage of exports of goods and services, Current account as a percentage of exports of goods and services, Net international liquidity as months of import cover, and Exchange rate instability.

The ICRG political risk rating is based on 100 points and the financial risk rating on 50 points. A higher score indicates a lower risk in both indices. For the sake of comparison and easy interpretation, we transform the ratings as follows:

Political Risk = 100 – ICRG Political Risk Rating.
Financial Risk = 100 – (2 * ICRG Financial Risk Rating).

3.2.2. Control variables

Following the literature on FDI (Blonigen, 2005; di Giovanni, 2005; Head and Ries, 2008; Erel *et al*., 2012, etc.), we include as control variables a number of source and host country specific variables: population, GDP per capita, and natural resource rent (% GDP) to account for natural- resource-

[13] The Political Risk index is based on 100 points, Financial Risk on 50 points, and Economic Risk on 50 points. We use only the Political Risk index and the Financial Risk index because most of the sub-indices included in the Economic Risk index are also included as control variables in our regression equation.

seeking FDI.[14] We also include a number of country-pair variables: distance, contiguity, and common language dummy.[15]

Furthermore, to account for the wage differential between host and source countries, we include a variable showing the relative difference in GDP per capita (*GDPPC_Dif*) defined as follows:

$$GDPPC\_Dif_{ijt} = \frac{\left|GDPPC_{it} - GDPPC_{jt}\right|}{GDPPC_{it} + GDPPC_{jt}},$$

where *GDPPC* represents GDP per capita. The difference in GDP per capita can also be considered as productivity difference between source and host countries.

To minimize the liability of foreignness and the risk involved, MNEs may invest in host countries that have already signed bilateral investment treaties (BITs) with their source countries (Egger and Pfaffermayr, 2004; Neumayer and Spess, 2005; Busse *et al*., 2010). To account for this, a dummy variable for effective bilateral investment treaties (BITs) is included. BIT enters the model with value 1 whenever there is an effective bilateral investment treaty between country i and country j in any year t and value 0 otherwise.

4. EMPIRICAL RESULTS

4.1. PPML Results

Table 2 reports the benchmark results obtained by PPML with the usual fixed effects, as shown by equation (1). Reported in columns (1), (2), and (3)

[14] Having noted theoretical discussions on tariff jumping FDI, we also introduced weighted mean tariffs for all products as a host country characteristic and found an insignificant result. This is so perhaps because our data are not sufficiently disaggregated to uncover this motive of FDI.

[15] Note that time-varying variables will enter as both level and change, while time-invariant variables will enter only as level.

Table 2 PPML Specification with Fixed Effects

	(1)	(2)	(3)
	All Host Countries	High-income	Developing
Political Risk - host	–0.011***	–0.003	–0.031***
	(0.003)	(0.003)	(0.007)
Financial Risk - host	–0.001	–0.003	0.005*
	(0.002)	(0.003)	(0.002)
log of Population - source	0.183	0.451	–1.461
	(0.662)	(0.664)	(1.545)
log of Population - host	1.588***	1.503***	1.626***
	(0.233)	(0.229)	(0.593)
log of GDP per Capita - source	0.328***	0.265***	0.680***
	(0.098)	(0.082)	(0.226)
GDP per Capita - host	0.493***	0.306***	0.675***
	(0.066)	(0.087)	(0.152)
Difference between Source and Host GDP per Capita	0.523*	0.486	0.232
	(0.291)	(0.316)	(0.190)
Rent on Natural Resource - host	0.006	0.003	0.013**
	(0.004)	(0.005)	(0.006)
Bilateral Investment Treaty (=1 if yes)	0.038	0.121	–0.095
	(0.095)	(0.127)	(0.100)
log of Distance	–0.272***	–0.178**	–1.132***
	(0.063)	(0.075)	(0.077)
Contiguity (=1 if yes)	0.604***	0.831***	–0.523**
	(0.159)	(0.166)	(0.225)
Common Language (=1 if yes)	0.984***	0.962***	0.811***
	(0.122)	(0.132)	(0.151)
Observsations	46,620	17,100	29,520
R-sq	0.816	0.835	0.705

Notes: Source and host country fixed-effects as well as year fixed effects are included. Country-pair clustered standard errors in parentheses. *** 1%, ** 5%, * 10%.

Table 3 PPML Specification with Extended Partial Adjustment

	(1) All Host Countries	(2) High-income	(3) Developing
(a) Differences			
Political Risk - host	–0.015***	–0.012*	–0.026***
	(0.005)	(0.007)	(0.007)
Financial Risk - host	0.004	0.004	0.012***
	(0.003)	(0.004)	(0.004)
Population - source	12.975*	3.655	39.017***
	(7.718)	(8.686)	(7.768)
Population - host	–11.350***	–8.574**	–4.775
	(3.882)	(3.874)	(5.150)
GDP per Capita - source	1.133***	1.052***	1.317***
	(0.191)	(0.222)	(0.270)
GDP per Capita - host	0.781***	0.956***	0.357*
	(0.194)	(0.259)	(0.210)
Difference between Source and Host GDP per Capita	–0.394	–0.351	0.362
	(0.636)	(0.732)	(0.571)
Rent on Natural Resource - host	–0.003	–0.022***	0.007
	(0.004)	(0.006)	(0.006)
Bilateral Investment Treaty (=1 if yes)	–0.163	–0.661***	–0.019
	(0.129)	(0.174)	(0.154)
(b) Levels (*t*–1)			
Lagged Dependent Variable	0.004***	0.004***	0.014***
	(0.001)	(0.001)	(0.002)
Political Risk - host	–0.032***	–0.026***	–0.049***
	(0.006)	(0.009)	(0.006)
Financial Risk - host	0.006	0.013*	0.021***
	(0.006)	(0.007)	(0.004)
Population - source	0.568***	0.524***	0.649***
	(0.050)	(0.055)	(0.032)
Population - host	0.603***	0.534***	0.758***
	(0.038)	(0.040)	(0.036)
GDP per Capita - source	0.968***	0.973***	0.722***
	(0.148)	(0.174)	(0.125)
GDP per Capita - host	0.484***	0.394***	0.680***
	(0.057)	(0.126)	(0.052)
Difference between Source and Host GDP per Capita	0.029	0.109	–0.271
	(0.181)	(0.197)	(0.218)
Rent on Natural Resource - host	–0.009**	–0.007	–0.005
	(0.004)	(0.006)	(0.003)

Bilateral Investment Treaty (=1 if yes)	0.129	–0.030	0.131
	(0.090)	(0.135)	(0.098)
(c) Levels (time-invariant)			
Distance	–0.216***	–0.219***	–0.472***
	(0.056)	(0.057)	(0.068)
Contiguity (=1 if yes)	0.272*	0.230	–0.107
	(0.160)	(0.175)	(0.155)
Common Language (=1 if yes)	0.881***	0.904***	0.904***
	(0.111)	(0.138)	(0.125)
Observations	44,260	16,120	28,140
R-sq	0.745	0.769	0.710

Notes: Year fixed effects are included. Country-pair clustered standard errors in parentheses. *** 1%, ** 5%, * 10%.

are the results for all host countries (135), high-income host countries (49), and developing host countries (86), respectively. A greater political risk of host countries is found to have a negative impact on cross-border M&A sales when all countries are included as host countries. When the sample is split into high-income and low-income country groups, a significant negative association is only found in the sample for developing countries. In contrast, financial risk of host countries is found to have a positive association with M&A sales in developing countries. This finding is in line with Byun *et al*. (2012).

The results for control variables are consistent with the literature. Regardless of host country groups, population size of host countries and income per capita of both home and host countries have a positive association with cross-border M&A sales. Distance and common language dummies also show statistically significant negative and positive association, respectively, with cross-border M&A sales, consistent with the literature. Developing countries with greater natural resources are found to have a greater FDI inflow in the form of M&A. Bilateral investment treaties enter insignificantly.

Table 3 repots the PPML results for equation (6), which is our preferred extended partial adjustment specification. We report the results for equation (6), rather than for equation (5), because in the case of equation (5) the dependent variable (i.e., the first difference of FDI flows) adopts negative values, which are not permitted when employing a PPML estimator.

In the equation for the group of developing host countries, the first difference form of the financial risk variable shows a highly significant positive coefficient, suggesting that a sudden increase of financial risk of a developing country may trigger an increase in influx of cross-border M&As. This finding may lend support to the argument for 'fire-sale FDI' during a financial crisis in developing countries. That is, when financial risk increases during the financial crisis period, foreign acquirers increase their purchases of local firms in the crisis-hit countries. However, the initial level of financial risk is also found to have a highly significant positive association with M&A in the group of developing host countries. Therefore, further research should be carried out to investigate the question of why foreign acquirers increase their purchases of local firms when the host country's financial risk has already reached a high level. In contrast, political risk has a negative impact on cross-border M&A sales, not only in the short term but also in the long term, for all host country groups.

Income per capita of both home and host countries is also found to have a positive association with cross-border M&A sales in both the short term and the long term, regardless of host country groups. The lagged level of population size of host countries also clearly has a positive association with cross-border M&A in both country groups but carries a negative coefficient in its first difference variable in the high-income host country group. This finding is somewhat at odds with common wisdom, but we do not attach a high degree of reliability to this finding because population is a very persistent variable.

As discussed earlier, applying a PPML estimator has advantages over log-linear gravity model estimation in producing consistent coefficients and naturally incorporating zero FDI values. However, it does not allow for the fact that MNEs' overseas investment decisions can be considered as a two-stage procedure involving a decision to invest or not to invest (selection stage) and then a decision on how much they will actually invest (outcome stage). Therefore, we now turn to the results obtained by applying the Heckman Selection estimator.

4.2. Heckman Sample Selection Estimator Results

Table 4 reports the results of the extended partial adjustment specification obtained by the Heckman estimator, as shown by equation (6). Note that the dependent variable is the log of the number of M&A deals. The table covers both the selection equations and the outcome equations. While the selection equation estimates the source country's decision on whether or not to invest at all in a country, the outcome equation estimates the source country's decision on whether or not to increase its investment in a country, given that it has already made a positive investment. Note that included only in the selection equations is a dummy variable that enters with zero if the number of M&A deals in the previous period is zero.

We find that when the host country group consists of developing countries only, the financial risk variable in its difference form enters with a highly significant negative coefficient in both the selection and outcome equations. This suggests that when there is an increase in the financial risk of a host country, the cross-border M&A sales of its domestic firms rise because of increases in the extensive margin (new countries acquire the source country's domestic assets) and also increases in the intensive margin (existing investors increase purchases of the source country's assets). We also find that the financial risk variable in its level form carries highly significant positive coefficients among the group of developing host countries. Among the group of high-income countries, however, such a relationship between financial risk and cross-border M&A appears to prevail only marginally in the long term.

In contrast, we find that the difference form of the political risk variable carriers a statistically significant negative coefficient in both main and selection equations, irrespective of income level of host countries. For the group of high-income host countries, we also find that the initial level of political risk index reveals a statistically significant negative coefficient in the main equation, suggesting that higher political risk of high-income host countries deters new entry into those countries in the long term.

Among the control variables, population and GDP per capita of both source

Table 4 Heckman Specification with Extended Partial Adjustment

	(1)		(2)	
	High-income		Developing	
	Main	Select	Main	Select
(a) Differences				
Political Risk - host	–0.008**	–0.016	–0.007	–0.012
	(0.004)	(0.010)	(0.006)	(0.008)
Financial Risk - host	–0.000	–0.001	0.009***	0.007**
	(0.002)	(0.005)	(0.003)	(0.003)
Population - source	4.186**	–2.306	15.520***	29.167***
	(1.991)	(5.344)	(4.695)	(6.229)
Population - host	0.844	1.541	–1.562	–3.578
	(0.750)	(1.582)	(2.350)	(3.598)
GDP per Capita - source	0.578***	1.065***	0.605**	0.571
	(0.138)	(0.366)	(0.271)	(0.349)
GDP per Capita - host	0.145	0.568*	0.304**	0.340*
	(0.130)	(0.296)	(0.149)	(0.198)
Difference between Source and Host GDP per Capita	–0.198	–0.237	–0.136	–0.877
	(0.288)	(0.674)	(0.367)	(0.567)
Rent on Natural Resource - host	–0.004	–0.012	0.009	0.011
	(0.006)	(0.010)	(0.005)	(0.007)
Bilateral Investment Treaty (=1 if yes)	0.062	–0.117	–0.091	0.008
	(0.160)	(0.270)	(0.103)	(0.150)
(b) Levels (*t*–1)				
Lagged Dependent Variable	0.666***		–0.466***	
	–0.017		(0.055)	
Political Risk - host	–0.009***	–0.030***	–0.017***	–0.030***
	(0.002)	(0.005)	(0.005)	(0.005)
Financial Risk - host	0.006***	0.007*	0.005**	0.010***
	(0.002)	(0.004)	(0.002)	(0.003)
Population - source	0.189***	0.390***	0.269***	0.382***
	(0.014)	(0.027)	(0.041)	(0.028)
Population - host	0.176***	0.487***	0.292***	0.472***
	(0.015)	(0.024)	(0.049)	(0.028)
GDP per Capita - source	0.365***	0.871***	0.277***	0.448***
	(0.052)	(0.122)	(0.092)	(0.108)
GDP per Capita - host	0.122***	0.249***	0.209***	0.338***
	(0.031)	(0.077)	(0.042)	(0.042)
Difference between Source and Host GDP per Capita	–0.096**	-0.130	–0.137	0.018
	(0.040)	(0.117)	(0.099)	(0.148)

Rent on Natural Resource - host	0.005***	–0.011***	0.003	0.005
	(0.002)	(0.003)	(0.002)	(0.003)
Bilateral Investment Treaty (=1 if yes)	0.059*	0.262***	–0.030	0.044
	(0.035)	(0.088)	(0.045)	(0.066)
(c) Levels (time-invariant)				
Distance	–0.133***	–0.369***	–0.216***	–0.304***
	(0.013)	(0.030)	(0.045)	(0.052)
Contiguity (=1 if yes)	0.061	0.416**	0.331***	0.323
	(0.049)	(0.166)	(0.093)	(0.199)
Common Language (=1 if yes)	0.293***	0.682***	0.323***	0.522***
	(0.044)	(0.110)	(0.086)	(0.102)
(d) Zero Dummies				
Zero Dummy (*t*)		–10.083***		–7.573***
		(0.259)		(0.080)
Mills Ratio (lambda)	0.121 (0.040)		0.637 (0.144)	
Observations	14,517		26,243	
Uncensored Obs.	6,364		3,117	

Notes: Year fixed effects are included. Country-pair clustered standard errors in parentheses. *** 1%, ** 5%, * 10%.

and host countries are found to have strong, positive long-term effects on cross-border M&A sales, in terms of both extensive margin (selection equation) and intensive margin (main equation), while their short-term effects are rather slight. It is also found that distance has a negative effect on cross-border M&A, whereas contiguity and common language have a positive impact on cross-border M&A.

4.3. Different Investors

We have found that that higher financial risk of host countries is associated with a greater level of FDI inflows in the form of M&A, not only in the short term but also in the long term. One may conjecture that acquirers from different countries may respond differently to the financial risk of a potential recipient country. Therefore, we repeat the entire regression, splitting the source countries into two groups: the top 10 major source countries vs. 11th-20th source countries.

Table 5 Major 10 Investors vs. Other Investors

Dependent Variable: Number of Cross-border M&A Deals				
Home Countries	(1)	(2)	(3)	(4)
	Major 10 Countries		11th-20th Countries	
Host Countries	High-income	Developing	High-income	Developing
(a) Differences				
Political Risk - host	–0.011	–0.027***	–0.026**	–0.024***
	(0.007)	(0.008)	(0.012)	(0.007)
Financial Risk - host	0.001	0.010***	0.016***	0.007
	(0.005)	(0.004)	(0.005)	(0.005)
Population - source	17.580	68.842***	0.279	–10.067
	(11.528)	(11.142)	(7.659)	(7.910)
Population - host	–7.496*	4.241	–33.093***	–7.706*
	(3.982)	(5.004)	(6.867)	(4.001)
GDP per Capita - source	0.424*	0.778***	–0.472	0.116
	(0.235)	(0.293)	(0.370)	(0.371)
GDP per Capita - host	0.768**	0.270	0.743***	1.489***
	(0.302)	(0.229)	(0.248)	(0.384)
Difference between Source and Host GDP per Capita	–0.095	1.134*	–2.177***	0.293
	(0.827)	(0.659)	(0.559)	(0.773)
Rent on Natural Resource - host	–0.019***	0.006	0.005	–0.022**
	(0.007)	(0.006)	(0.014)	(0.010)
Bilateral Investment Treaty (=1 if yes)	–0.705***	–0.073	0.027	–0.176
	(0.195)	(0.190)	(0.197)	(0.240)
(b) Levels (*t*–1)				
Lagged Dependent Variable	0.004***	0.014***	0.074***	0.044***
	(0.001)	(0.002)	(0.016)	(0.005)
Political Risk - host	–0.025***	–0.049***	–0.041***	–0.037***
	(0.010)	(0.006)	(0.011)	(0.008)
Financial Risk - host	0.006	0.019***	0.029***	0.023***
	(0.008)	(0.004)	(0.006)	(0.006)
Population - source	0.454***	0.480***	0.350***	0.222***
	(0.070)	(0.042)	(0.082)	(0.069)
Population - host	0.537***	0.798***	0.794***	0.516***
	(0.045)	(0.042)	(0.040)	(0.034)
GDP per Capita - source	0.266	–0.123	0.100	0.618***
	(0.212)	(0.189)	(0.273)	(0.227)
GDP per Capita - host	0.361**	0.685***	0.658***	0.431***
	(0.143)	(0.061)	(0.083)	(0.150)
Difference between Source and Host GDP per Capita	0.313	0.124	–0.251	–0.191
	(0.241)	(0.246)	(0.233)	(0.161)
Rent on Natural Resource - Host	–0.009	–0.006	–0.005	0.000
	(0.006)	(0.004)	(0.005)	(0.007)

Bilateral Investment Treaty (=1 if yes)	–0.112	0.035	0.205	0.317**
	(0.160)	(0.107)	(0.129)	(0.132)
(c) Levels (time-invariant)				
Distance	–0.235***	–0.564***	–0.411***	–0.361***
	(0.065)	(0.077)	(0.063)	(0.055)
Contiguity (=1 if yes)	0.014	–0.315**	0.625**	0.492**
	(0.202)	(0.124)	(0.266)	(0.193)
Common Language (=1 if yes)	0.850***	0.658***	1.292***	0.013
	(0.148)	(0.146)	(0.241)	(0.193)
Observations	8,060	14,070	14,070	8,060
R-sq	0.804	0.741	0.486	0.561

Notes: Year fixed effects are included. Country-pair clustered standard errors in parentheses. *** 1%, ** 5%, * 10%.

Table 5 reports the results obtained by employing the PPML estimator.[16] We focus our discussions only on financial risk of host countries. When the source countries are confined to the top 10 major source countries, both the first difference form and the initial level of financial risk have a highly significant positive association with M&A in the group of developing host countries. Thus, investors from the top 10 major countries increase their purchases of foreign firms of a developing country when there is an increase in the financial risk of the developing country, not only in the short term but also in the long term. However, acquirers from the top 10 major countries do not appear to respond to a change in the financial risk of a high-income country.

Acquirers from the 11th-20th OECD countries also respond positively to a foreign country's financial risk and increase their purchases of foreign firms, but interestingly, only for other high-come countries, rather than developing countries. As seen in table 1, the top 10 major countries account for over 80% of OECD's total cross-border M&As, while the 11th-20th investors account for only about 5.8% of OECD's total cross-border M&As. Therefore, 'fire-sale FDI' during the financial crisis in developing countries becomes more readily visible.

In contrast, political risk has a negative impact on cross-border M&A sales, not only in the short term but also in the long term, regardless of host country groups.

[16] For the sake of brevity, we do not report the results obtained by the Heckman sample selection procedure. These results are available upon request.

4.4. Robustness Check: Excluding Crisis-hit Countries

One may conjecture that our finding is just a statistical artifact due to the crisis-hit countries in the sample. In order to assess if this is the case, we re-ran regressions excluding the countries which experienced a financial crisis during the sample period 1995-2012. Among the 86 developing countries in our sample, they were Argentina, Brazil, Indonesia, Malaysia, Mexico, the Philippines, and Thailand, while among the 49 high-income countries, they were Cyprus, Greece, Ireland, Korea, Portugal, Russia, and Spain.[17] The results obtained by the PPML are reported in table 6.

Column 2 reports the results for the group of developing countries excluding the crisis-hit countries, while column 4 reports the results for the group of high-income countries excluding the crisis-hit countries. For comparison, Column 1 and 3 report the results for all developing and high-income countries, respectively, which were already reported in table 3. Even after excluding the crisis-hit countries among the host group of developing countries we find that higher financial risk of host countries is associated with a greater level of FDI inflows in the form of M&A, not only in the short term but also in the long term. For the host group of high-income countries, we also find that short-term change in financial risk does not affect cross-border M&A inflows to these countries, even when we exclude the crisis-hit countries. Thus, we find a very similar result for both groups of host countries even after we exclude the countries which experienced a financial crisis during the sample period.

[17] Our classification is based on the World Bank's 2012 country classification, which classifies Korea as a high-income country.

Table 6 Robustness Check: Excluding Crisis-hit Countries

Dependent Variable: Number of Cross-border M&A Deals				
Home Countries	(1)	(2)	(3)	(4)
	Major 10 Countries		11th-20th Countries	
Host Countries	High-income	Developing	High-income	Developing
(a) Differences				
Political Risk - host	–0.011	–0.027***	–0.026**	–0.024***
	(0.007)	(0.008)	(0.012)	(0.007)
Financial Risk - host	0.001	0.010***	0.016***	0.007
	(0.005)	(0.004)	(0.005)	(0.005)
Population - source	17.580	68.842***	0.279	–10.067
	(11.528)	(11.142)	(7.659)	(7.910)
Population - host	–7.496*	4.241	–33.093***	–7.706*
	(3.982)	(5.004)	(6.867)	(4.001)
GDP per Capita - source	0.424*	0.778***	–0.472	0.116
	(0.235)	(0.293)	(0.370)	(0.371)
GDP per Capita - host	0.768**	0.270	0.743***	1.489***
	(0.302)	(0.229)	(0.248)	(0.384)
Difference between Source and Host GDP per Capita	–0.095	1.134*	–2.177***	0.293
	(0.827)	(0.659)	(0.559)	(0.773)
Rent on Natural Resource - host	–0.019***	0.006	0.005	–0.022**
	(0.007)	(0.006)	(0.014)	(0.010)
Bilateral Investment Treaty (=1 if yes)	–0.705***	–0.073	0.027	–0.176
	(0.195)	(0.190)	(0.197)	(0.240)
(b) Levels (*t*–1)				
Lagged Dependent Variable	0.004***	0.014***	0.074***	0.044***
	(0.001)	(0.002)	(0.016)	(0.005)
Political Risk - host	–0.025***	–0.049***	–0.041***	–0.037***
	(0.010)	(0.006)	(0.011)	(0.008)
Financial Risk - host	0.006	0.019***	0.029***	0.023***
	(0.008)	(0.004)	(0.006)	(0.006)
Population - source	0.454***	0.480***	0.350***	0.222***
	(0.070)	(0.042)	(0.082)	(0.069)
Population - host	0.537***	0.798***	0.794***	0.516***
	(0.045)	(0.042)	(0.040)	(0.034)
GDP per Capita - source	0.266	–0.123	0.100	0.618***
	(0.212)	(0.189)	(0.273)	(0.227)
GDP per Capita - host	0.361**	0.685***	0.658***	0.431***
	(0.143)	(0.061)	(0.083)	(0.150)
Difference between Source and Host GDP per Capita	0.313	0.124	–0.251	–0.191
	(0.241)	(0.246)	(0.233)	(0.161)
Rent on Natural Resource - host	–0.009	–0.006	–0.005	0.000
	(0.006)	(0.004)	(0.005)	(0.007)
Bilateral Investment Treaty (=1 if yes)	–0.112	0.035	0.205	0.317**
	(0.160)	(0.107)	(0.129)	(0.132)

(c) Levels (time-invariant)				
Distance	–0.235***	–0.564***	–0.411***	–0.361***
	(0.065)	(0.077)	(0.063)	(0.055)
Contiguity (=1 if yes)	0.014	–0.315**	0.625**	0.492**
	(0.202)	(0.124)	(0.266)	(0.193)
Common Language (=1 if yes)	0.850***	0.658***	1.292***	0.013
	(0.148)	(0.146)	(0.241)	(0.193)
Observations	8,060	14,070	14,070	8,060
R-sq	0.804	0.741	0.486	0.561

Notes: Year fixed effects are included. Country-pair clustered standard errors in parentheses. *** 1%, ** 5%, * 10%.

4.5. Sub-components of Financial Risk Index

In order to assess the question of why countries with increasing financial risk may witness increasing sales of their domestic firms to foreign investors, we repeated our regressions after replacing the aggregate financial risk index with each of its five components: (i) foreign debt as % of GDP, (ii) exchange rate instability, (iii) debt service as % of exports, (iv) current account as % of GDP, and (v) international liquidity. In a similar way to the aggregate financial risk index, all components are transformed to a maximum value of 100 for the highest level of risk and a minimum value of zero for the lowest level of risk.

The results obtained by applying the PPML and Heckman sample selection models are reported in table 7. Among the five components of financial risk index, exchange rate instability, debt service as % of exports, current account as % of GDP, and international liquidity carry positive and significant coefficients when the hosts are developing countries. Foreign debt as % of GDP, exchange rate instability (PPML only), and current account as % of GDP (Heckman only) also appear to become relevant when the hosts are high-income countries.

An exception is foreign debt as % of GDP, which carries a marginally significant positive coefficient among the developing countries (Heckman only), implying that countries with a higher level of foreign debt may receive a smaller number of cross-border M&A deals.

Table 7 Effects of Different Components of Financial Risk on Number of Cross-border M&A Deals

	Foreign Debt as % of GDP		Exchange Rate Stability		Debt Service as % of Exports		Current Account as % of GDP		International Liquidity	
	High-income	Developing	High-income	Developing	High-income	Developing	High-income	Developing	High-income	Developing
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
PPML										
Financial Risk – host (d)	0.003*	0.001	0.008***	0.002	0.002	0.002	–0.001	0.009***	–0.001	0.003***
	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.004)	(0.002)	(0.001)	(0.001)
Financial Risk - host (*t*–1)	0.005**	0.003	0.017***	0.005**	0.004	0.009***	0.003	0.013***	–0.000	–0.001
	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)	(0.006)	(0.003)	(0.000)	(0.001)
Heckman										
Main										
Financial Risk - host (d)	–0.000	–0.002	0.000	0.000	0.000	0.002	–0.003	0.010***	–0.001	0.003***
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
Financial Risk - host (*t*–1)	0.001**	–0.002*	0.002	–0.000	0.000	0.002**	0.002**	0.002*	–0.000	–0.001
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)
Select										
Financial Risk – host (d)	0.000	0.000	0.000	0.004***	0.003	0.005**	–0.003	0.005*	–0.000	–0.002
	(0.002)	(0.002)	(0.002)	(0.001)	(0.003)	(0.002)	(0.005)	(0.003)	(0.002)	(0.002)
Financial Risk - host (*t*–1)	–0.001	0.003	0.005	0.006***	0.003	0.005***	0.009**	0.005*	0.001	–0.001
	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)	(0.004)	(0.003)	(0.002)	(0.001)

Notes: The estimates for the financial risk variable (in level and difference) are taken from various regressions using different components of financial risk. For the sake of brevity, the estimates for all other control are not reported. The dependent variable is the number of annual cross-border M&As. Year fixed effects are included. Distance clustered standard errors in parentheses. *** 1%, ** 5%, * 10%.

5. SUMMARY AND CONCLUDING REMARKS

While it has been relatively well documented that high political risk of host countries deters FDI inflows, there have been very few studies on how financial risk of host countries affects FDI inflows. We have evaluated the influence of financial risk on cross-border M&A. A striking and robust result is that higher financial risk of host countries is associated with higher levels of M&A. This finding seems greater when host countries are developing countries and source countries are the top 10 major OECD investors.

Our results may lend support to the 'fire-sale' argument: a sudden increase in financial risk of a host country during a financial crisis is reflected in a weak currency, which in turn lowers the cost of acquisition to foreign buyers and/or is reflected in an illiquidity that is eased by foreign investment. The 'fire-sale' argument refers to the 'short-term' surge in foreign acquisitions of local firms during the financial crisis and subsequent re-sales to local investors once the crisis abates. However, the positive association between financial risk of host countries and M&A sales is found not only as a short-term but also as a long-term phenomenon. Therefore, further research should be carried out on the question of why foreign acquirers increase their purchases of local firms when the host country's financial risk increases.

Among the various components comprising financial risk, exchange rate instability, debt service as % of exports, current account as % of GDP, and international liquidity are found to be significant when the host country is a developing country. Foreign debt as % of GDP, exchange rate instability (PPML only), and current account as % of GDP (Heckman only) also appear to become relevant when the hosts are high-income countries.

APPENDIX

Table A1 List of Source and Host Countries

Source Countries (20)		Host Countries (135)				
		High-income Countries (49)		Developing Countries (86)		
Major Source Countries (10)	Other Source Countries (10)	OECD Countries (31)	Non-OECD Countries (18)	Upper Middle-income Countries (36)	Lower Middle-income Countries (30)	Low-income Countries (20)
Australia	Austria	Australia	Bahamas	Albania	Armenia	Bangladesh
Canada	Belgium	Austria	Bahrain	Algeria	Bolivia	Burkina Faso
France	Denmark	Belgium	Brunei	Angola	Cameroon	Dem Rep Congo
Germany	Finland	Canada	Croatia	Argentina	Egypt	Ethiopia
Japan	Ireland	Chile	Cyprus	Azerbaijan	El Salvador	Gambia
Netherlands	Italy	Czech Republic	Hong Kong	Belarus	Ghana	Guinea
Sweden	Luxembourg	Denmark	Kuwait	Botswana	Guatemala	Guinea-Bissau
Switzerland	Norway	Estonia	Latvia	Brazil	Guyana	Haiti
United Kingdom	South Korea	Finland	Lithuania	Bulgaria	Honduras	Kenya
United States	Spain	France	Malta	China	India	Liberia
		Germany	Oman	Colombia	Indonesia	Madagascar
		Greece	Qatar	Costa Rica	Ivory Coast	Malawi
		Iceland	Russian Fed	Cuba	Moldova	Mali
		Ireland-Rep	Saudi Arabia	Dominican Rep	Mongolia	Mozambique
		Israel	Singapore	Ecuador	Morocco	Niger
		Italy	Trinidad&Tob	Gabon	Nicaragua	Sierra Leone
		Japan	Uruguay	Hungary	Nigeria	Tanzania
		Luxembourg	Utd Arab Em	Iran	Pakistan	Togo
		Netherlands		Iraq	Papua N Guinea	Uganda
		New Zealand		Jamaica	Paraguay	Zimbabwe
		Norway		Jordan	Philippines	
		Poland		Kazakhstan	Rep of Congo	
		Portugal		Lebanon	Senegal	
		Slovak Rep		Libya	Sri Lanka	
		Slovenia		Malaysia	Sudan	
		South Korea		Mexico	Syria	
		Spain		Namibia	Ukraine	
		Sweden		Panama	Vietnam	
		Switzerland		Peru	Yemen	
		United Kingdom		Romania	Zambia	
		United States		South Africa		
				Surinam		
				Thailand		
				Tunisia		
				Turkey		
				Venezuela		

REFERENCES

Acharya, Viral V., Hyun Song Shin, and Tanju Yorulmazer, "Fire Sale FDI," mimeo, Princeton University, 2011.

Aguiar, Mark and Gita Gopinath, "Fire-Sale Foreign Direct Investment and Liquidity Crises," *Review of Economics and Statistics*, 87(3), 2005, pp. 439-452.

Anderson, James E. and Eric V. Wincoop, "Gravity with Gravitas: A Solution to the Border Puzzle," *American Economic Review*, 93(1), 2003, pp. 170-192.

Blonigen, Bruce A., "A Review of the Empirical Literature on FDI Determinants," *Atlantic Economic Journal*, 33(4), 2005, pp. 383-403.

Busse, Matthias and Carsten Hefeker, "Political Risk, Institutions and Foreign Direct Investment," *European journal of Political Economy*, 23(2), 2007, pp. 397-415.

Busse, M., J. Königer, and P. Nunnenkamp, "FDI Promotion through Bilateral Investment Treaties: More than a Bit?," *Review of World Economics*, 146(1), 2010, pp. 147-177.

Byun, H., H.-H. Lee, and C.-Y. Park, "Assessing the External and Internal Factors Influencing Foreign Direct Investment in Emerging Countries Comparison of M&A and Greenfield FDI," ADB Economics Working Paper Series, No. 293, Asian Development Bank, 2012.

Coeurdacier, Nicolas, Roberto A. De Santis, and Antonin Aviat, "Cross-border Mergers and Acquisitions: Financial and Institutional Forces," Working Paper Series, No. 1019, European Central Bank, 2009.

Dailami, Mansoor, Sergio Kurlat, and Jamus Jerome Lim, "Bilateral M&A Activity from the Global *South*," *The North American Journal of Economics and Finance*, 23(3), 2012, pp. 345-364.

Davies, Ronald B. and Helga Kristjánsdóttir, "Fixed Costs, Foreign Direct Investment, and Gravity with Zeros," *Review of International Economics*, 18(1), 2010, pp. 47-62.

di Giovanni, Julian, "What Drives Capital Flows? The Case of Cross-border

M&A Activity and Financial Deepening," *Journal of International Economics*, 65(1), 2005, pp. 127-149.

Edwards, Sebastian, "Capital Flows, Foreign Direct Investment, and Debt-Equity Swaps in Developing Countries," Working Paper Series, No. 3497, Cambridge, MA: National Bureau of Economic Research, 1992.

Egger, Peter and Michael Pfaffermayr, "The Impact of Bilateral Investment Treaties on Foreign Direct Investment," *Journal of Comparative Economics*, 32(4), 2004, pp. 788-804.

Erel, Isil, Rose C. Liao, and Michael S. Weisbach, "Determinants of Cross-border Mergers and Acquisitions," *The Journal of Finance*, 67(3), 2012, pp. 1045-1082.

Globerman, Steven and Daniel Shapiro, "Assessing International Mergers and Acquisitions as a Mode of Foreign Direct Investment," Conference on Multinationals, Growth and Governance, in Honor of A. Edward Safarian, Toronto, Ontario, April 24-25, 2004.

Harvie, Charles and Hyun-Hoon Lee, *Korea's Economic Miracle — Fading or Reviving*," London: Palgrave Macmillan, 2003.

Hayakawa, Kazunobu, Fukunari Kimura, and Hyun-Hoon Lee, "How Does Country Risk Matter for Foreign Direct Investment?," *The Developing Economies*, 51(1), 2013, pp. 60-78.

Head, Keith and John Ries, "FDI as an Outcome of the Market for Corporate Control: Theory and Evidence," *Journal of International Economics*, 74(1), 2008, pp. 2-20.

Helpman, Elhanan, Marc Melitz, and Yona Rubinstein, "Estimating Trade Flows: Trading Partners and Trading Volumes," *Quarterly Journal of Economics*, 123(2), 2008, pp. 441-487.

Huh, Chan-Guk and Kwanghee Nam, "A Preview of Table of Korea's Two Crises: Distinct Aftermaths of 1997 and 2008 Crises," *Korea and the World Economy*, 11(1), 2010, pp. 1-29.

Kim, Soyoung, Sunghyun Kim, and Yoonseok Choi, "Determinants of International Flows in Korea: Push vs. Pull Factors," *Korea and the World Economy*, 14(3), 2013, pp. 447-474.

Kleinert, Jörn and Farid Toubal, "Gravity for FDI," *Review of International Economics*, 18(1), 2010, pp. 1-13.

Kogut, Bruce and Harbir Singh, "The Effect of National Culture on the Choice of Entry Mode," *Journal of International Business Studies*, 1988, pp. 411-432.

Krugman, Paul, "Fire-sale FDI," in *Capital Flows and the Emerging Economies: Theory, Evidence, and Controversies*, University of Chicago Press, 2000, pp. 43-58.

Lee, Hyun-Hoon, Chung Mo Koo, and Euijeong Park, "Are Exports of China, Japan and Korea Diverted in the Major Regional Trading Blocs?," *The World Economy*, 31(7), 2008, pp. 841-860.

Lee, Hyun-Hoon and Ramkishen S. Rajan, "Foreign Direct Investment in the APEC Region: the Role of Country Risks," *Journal of Korea Trade*, 15(3), 2011, pp. 44-56.

Neto, Paula, António Brandão, and António Cerqueira, "The Macroeconomic Determinants of Cross Border Mergers and Acquisitions and Greenfield Investments," *The IUP Journal of Business Strategy*, 7(1), 2010, pp. 21-57.

Neumayer, Eric and Laura Spess, "Do Bilateral Investment Treaties Increase Foreign Direct Investment to Developing Countries?," *World Development*, 33(10), 2005, pp. 1567-1585.

Nocke, Volker and Stephen Yeaple, "Cross-border Mergers and Acquisitions vs. Greenfield Foreign Direct Investment: The Role of Firm Heterogeneity," *Journal of International Economics*, 72(2), 2007, pp. 336-365.

_____, "An Assignment Theory of Foreign Direct Investment," *The Review of Economic Studies*, 75(2), 2008, pp. 529-557.

Razin, Assaf, Yona Rubinstein, and Efraim Sadka, "Fixed Costs and FDI: the Conflicting Effects of Pproductivity Shocks," Working Paper Series, No. 10864, National Bureau of Economic Research, 2004.

Santos Silva, Joao and Silvana Tenreyro, "The Log of Gravity," *The Review of Economics and Statistics*, 88(4), 2006, pp. 641-658.

_____, "Trading Partners and Trading Volumes: Implementing the Helpman-Melitz-Rubinstein Model Empirically," CEP Discussion Paper, No. 935, Centre for Economic Performance, 2009.

Schneider, Friedrich and Bruno S. Frey, "Economic and Political Determinants of Foreign Direct Investment," *World Development*, 13(2), 1985, pp. 161-175.

Shepherd, Ben, "The Gravity Model of International Trade: A User Guide," *ARTNeT Books and* Research *Reports*, 2013.

Stepanok, Ignat, "Cross-border Mergers and Greenfield Foreign Direct Investment," *Review of International Economics*, 23(1), 2015, pp. 111-136.