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The (Non-)Resiliency of Foreign Direct Investment in the United States during the 2007-2009 Financial Crisis*

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Abstract

We study the contraction of foreign direct investment (FDI) flows in the United States during the recent financial crisis and show their unusual non-resiliency, which depends in part on the global nature of the economic recession, but also on the increases in the cost of financing FDI in the economies in which the flows originate. To formally study the effects of external financial conditions on FDI in the United States, we exploit the three dimensions of a panel of U.S. inward FDI flows organized by recipient U.S. industries, source countries, and years for the recorded flows. Changes in the cost of finance in the source countries have little or no effect on total inward flows (the sum of equity, debt, and reinvested earnings) over the 2006-2010 period. However, U.S. industries characterized by more financial vulnerability experience statistically significant variations in the debt and equity components of inward FDI flows in response to the changes in the cost of capital that occurred in the source countries during the crisis.

JEL Classification Numbers: *F21, F23, F32, F36, G01.*

Keywords: *Capital Flows, Financial Crisis, FDI, Cost of Finance.*

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1 Introduction

This article documents the contraction of foreign direct investment flows into the United States at the peak of the 2007-2009 global financial crisis and describes the relationship between disaggregated FDI inflows and the cost of finance in the source economies. To study the effects of external finance on FDI in the United States, we analyze a three-dimensional panel of annual inward FDI flows, organized by U.S. recipient industries, source countries, and years for the recorded flows. We use data between 2006 and 2010 released by the Bureau of Economic Analysis (BEA) at the end of August 2011. The BEA reports FDI flows by industry and breaks them into three components: equity, debt, and reinvested earnings. We exploit the cross-industry variation in external finance vulnerability and the cross-country variation in the cost of capital to estimate the effects of the cost of capital on FDI inflows. We find little or no effect of the cost of finance in source countries on *total* U.S. inward flows. However, between 2008 and 2009, the U.S. industries characterized by a higher degree of financial vulnerability experienced statistically significant shifts in the debt and equity components of inward FDI flows, following the variations in the cost of capital that occurred in the source countries. Because we focus on a specific type of capital flows and a specific economy, our empirical investigation is less comprehensive than other studies in the cross-country dimension of capital flows. However, we have the advantage of detailed information and data on bilateral flows between major U.S. industries and a wide range of countries that is normally not available in studies on international capital flows.

The contraction of FDI flows into the United States that we observe in early 2009 appears unusual relative to other countries that previously experienced financial crises. In other instances, inward FDI tended to remain stable or even increased (Levchenko and Mauro, 2007). Such a lack of resiliency depends, in part, on the increases in the cost of funding FDI flows in the economies in which the flows originate, another unusual occurrence relative to other recent experiences.

It has been established that the crisis occurred at the same time for a large cross section of financially integrated countries either because of common shocks or because of interna-

tional contagion (Imbs, 2010; Rose and Spiegel, 2010). Unlike the global trade collapse, capital flows contracted too but with heterogeneous patterns along various dimensions. The contraction was particularly sharp for banking flows in advanced economies after September 2008. Research by Milesi-Ferretti and Tille (2011) for a wide set of countries and by Tille (2011, this issue) for Asian countries identifies the stylized facts and main drivers of the retrenchment in international capital flows during the recent crisis. Such a retrenchment was especially dramatic in the wake of the Lehman Brothers failure. Banking flows were the hardest hit due to their sensitivity to risk perceptions. Across regions, emerging economies experienced a shorter-lived retrenchment than developed economies. Countries reliant on bank flows were the hardest hit, in addition to those with weak domestic macroeconomic conditions. Cetorelli and Goldberg (2011) show that global banks played a significant role in the transmission of the 2007-2009 crisis to emerging market economies. They show that the loan supply in emerging markets was significantly affected through a contraction in direct cross-border lending from foreign banks, in local lending by foreign banks affiliates in emerging markets, and in the loan supply by domestic banks resulting from the decline in interbank lending. Similarly, Duwel, Frey, and Lipponer (2011) find that the German parent bank lending adjustment is based almost exclusively on bank-specific factors and that rising risk aversion among banks curbed cross-border lending during the crisis, especially after the collapse of Lehman Brothers.

The papers whose spirit is perhaps more related to our work are by Klein, Peek, and Rosengren (2002) and Buch, Kesternich, Lipponer, and Schnitzer (2009). Klein, Peek, and Rosengren (2002) explain the continuing decline in Japanese FDI flows to the United States during the 1990s with reduced access to credit by Japanese firms. The authors use a unique dataset that links individual Japanese firms engaged in FDI to their main banks. Using both bank-level and firm-level data, they find that financial difficulties at banks were economically and statistically important for explaining the reduction in the number of FDI projects by Japanese firms into the United States, even after controlling for the effects of fluctuations in the exchange rate and stock market prices. This article provides strong empirical evidence in favor of the fact that differences across firms in their degree of access to credit can be

an important determinant of FDI. Buch, Kesternich, Lipponer, and Schnitzer (2009) model how financial factors affect FDI decisions when firms exhibit heterogenous productivity levels. Their microeconomic evidence suggests that financial factors constrain firms' foreign investment decisions, particularly in the case of large firms. Financial constraints at the parent level matter for the decision to engage in multinational production but less so for the magnitude of foreign sales.[1]

This work is structured as follows. Sections 2 and 3 discuss the data and empirical strategy. Section 4 presents the results and Section 5 concludes.

2 Data

Many international transactions involving financial instruments – for example, bank loans, government securities, bonds, and equity – are channeled through markets with numerous buyers and sellers, standardized contracts, and publicly available prices. The market structures often approximate perfect competition. FDI, however, is not observed in financial markets. Rather, it is the result of financial and industrial decisions, internal to a particular firm, that may have real implications potentially unrelated to purely financial variables. Outward FDI flows are registered as being generated by firms incorporated in the reporting country, whereas inward direct investment flows represent the activity of foreign firms based in the host economy. For the United States, these flows are categorized by the BEA as United States Direct Investment Abroad (USDIA) and Foreign Direct Investment in the United States (FDIUS), respectively.[2]

Many national statistical agencies report total inward and outward flows. Total flows in a specific period, however, are often reported as the sum of four components: (1) equity investment; (2) intercompany debt investment; (3) reinvested earnings; and (4) valuation adjustments. These components are reported for U.S. inbound and outbound flows, whereas

[1]The present article is also related to a strand of economic literature that studies the behavior of disaggregated capital flows during crisis and non-crisis periods. See Levy-Yeyati, Panizza, and Stein (2007); Levchenko and Mauro (2007); Smith and Valderrama (2009); and Contessi, De Pace, and Francis (2010). A common finding of these papers is that capital flows from developed economies to emerging market economies are more volatile than flows entering developed economies.

[2]USDIA data can be negative when repatriation of foreign investment is larger than new investment.

they are generally not reported by the majority of other countries. We describe these four components in the Appendix.

We use quarterly annual data on FDI from the BEA.[3] The pre-crisis benchmark years are 2006 and 2007. We study the evolution of pairwise flows during the latest financial crisis and the subsequent recovery. Table 1 shows the shares of total inward (and outward) flows for each country, and their cumulative shares, over the 2006-2007 period. Inward FDI flows are more concentrated than outward flows: Only 13 countries contribute to more than 90% of U.S. inward FDI, while about 23 countries are the destinations of about 90% of U.S. outward FDI flows. Most inward FDI flows come from advanced countries and a large part of outward flows go to advanced economies. Analyzing capital flow data is usually difficult as the data for many countries are fragmented and not always available. In our empirical investigation we consider a list of 33 countries (in addition to the United States) with relatively consistent and complete time series.[4] We exclude the tax havens, but we keep the Netherlands, a popular host of multinationals' headquarters in part for tax reasons.[5] In the same table we report the stock of inward and outward flows for each country as of 2006.

The BEA reports quarterly FDI flows for each industry at the 2- and 3-digit North American Industry Classification System (NAICS) level (see Kort, 2001, Table 2). We use the same level of industry disaggregation in our empirical investigation.[6] We reconstruct four panels of data using the BEA quarterly U.S. FDI flows as reported in the Balance of Payments (International Transactions). We have inward flows (flows from abroad into the U.S., FDIUS), and outward flows (U.S. FDI abroad, USDIA).[7] The quarterly data can be broken

[3] `http://www.bea.gov/iTable/index_MNC.cfm`.

[4] Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, China, Denmark, France, Germany, Hong Kong, India, Indonesia, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Malaysia, Mexico, the Netherlands, New Zealand, Russia, Singapore, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, the United Kingdom, and the United States.

[5] Flows to and from these territories and countries may end up as indirect investment in third countries. In some countries, the round tripping of FDI also creates a significant mismeasurement of capital flows. A notable case is inward FDI in the People's Republic of China, which represents the return of Chinese capital taken abroad to escape foreign exchange controls.

[6] *Other Industries*, code 55-99, are excluded from the analysis.

[7] USDIA (FDIUS) is ownership by a U.S. (foreign) investor of at least 10% of a foreign (U.S.) business. See "Foreign Direct Investment in the U.S.: Balance of Payments and Direct Investment Position Data" (`http://www.bea.gov/international/di1fdibal.htm`) and "U.S. Direct Investment abroad: Balance of Payments and Direct Investment Position Data" (`http://www.bea.gov/international/di1usdbal.htm`).

down only by country or industry, but not by country and industry at the same time. Annual data from the same source can, instead, be disaggregated by individual components. The quarterly data (available for the period 1994:Q1-2011:Q1) are used for descriptive purposes in the first three figures, while the annual data are considered for estimation in the econometric exercise described in a later section. The four quarterly series are (1) $inFDI_{iq}$; (2) $outFDI_{iq}$; (3) $inFDI_{kq}$; and (4) $outFDI_{kq}$. The prefixes *in* and *out* in the mnemonics identify inward and outward flows, q identifies the quarter, i identifies the country, and k identifies the industry. The annual BEA data on the disaggregated capital flows (sample is 2006-2010) are identified by similar mnemonics. Therefore, we have a total of 8 additional variables measuring total FDI and its components: (5) $inFDItot_{ikt}$; (6) $outFDItot_{ikt}$; (7) $inFDIequi_{ikt}$; (8) $outFDIequi_{ikt}$; (9) $inFDIdebt_{ikt}$; (10) $outFDIdebt_{ikt}$; (11) $inFDIrearn_{ikt}$; and (12) $outFDIrearn_{ikt}$. The suffix *tot* identifies total flows without current-cost adjustment; *equi* identifies the equity component; *debt* identifies the intercompany debt component; and *rearn* identifies reinvested earnings. This time, t denotes the years.[8]

Several caveats apply to these data. The most relevant is that balance of payments transactions (and associated positions) between parents and affiliates are recorded against the country of the foreign affiliate with which the U.S. parent had a direct transaction, even if the transaction may reflect indirect claims on liabilities to or income from indirectly held affiliates in third countries. For example, the Bahamas is recorded as one of the top 10 beneficiaries of USDIA in 2006, but a large part of this investment is redirected toward other countries.[9] A second shortcoming is that, whereas, prior to 2006, income is presented net of U.S. and foreign withholding taxes, after 2006, income is presented gross of U.S. and foreign withholding taxes.

Figures 1 through 4 describe the evolution of FDI flows using the quarterly dataset. FDI

[8]Some observations in the dataset on capital flows are missing. Data may not be shown for several reasons: (1) The missing observation appears on another line in the table from which the data are collected, (2) the missing observation is not shown in the table from which the data are collected but may be available in other detailed country- or industry-level tables or in other BEA published tables on direct investment, (3) the missing observation is not available, does not apply, or is not defined. All the entries indicating a nonzero value between -500,000 and +500,000 dollars, firms with fewer than 50 employees, or indicating that the data in the cell have been suppressed to avoid disclosure of data of individual companies are converted to zero.

[9]Unfortunately, the BEA provides stock (position) data but not the flows by country of ultimate beneficiary. We are thus forced to exclude a few countries from our analysis, a decision that may affect our estimates.

inflows to the U.S. substantially drop at the beginning of 2009 (Figure 1). This drop also occurs in the rest of the developed world, but it looks much more pronounced in the United States. Figure 2 shows a decline (in 2009:Q1, but also in 2007:Q4) in the U.S. inward FDI measured as a percentage of gross domestic product (GDP). Outward FDI only drops at the beginning of 2009. The same pattern can be seen in Figure 3, where U.S. FDI flows in 2006 are normalized to 100. In Figure 4, the evolution of U.S. FDI inflows and outflows is disaggregated by type of flows and reported for all industries and the manufacturing sector only. With the exception of outflows in all industries, the decline in the size of the flows during the latest financial crisis is immediately apparent.[10]

In the empirical investigation that follows, we analyze some of the determinants of inward FDI and the variations in total and disaggregated flows during the 2007-2009 financial crisis. In the next subsections we provide a description of the variables, collected at the country and/or industry level, which we use in the estimation procedures.

2.1 Industry Characteristics

We compute measures of access to finance for 17 manufacturing and service industries as in the BEA-FDI Statistcs.[11] We use Compustat data for the 1999-2007 period and the BEA-FDI industry breakdown to compute three measures of external financial vulnerability and two measures of factor intensity for each industry.

Measures of External Financial Vulnerability. Empirical research exploiting cross-industry variation in financial dependence primarily uses three measures of financial vulnerability, which we recalculate for each industry using firm-level data from Compustat North America. A limitation of these data is that they are collected only for publicly traded firms. As customary in the literature (Rajan and Zingales, 1998), we use the fraction of total capital expenditure not financed by internal cash flows from operations, a variable that mea-

[10] Such a decline may have been caused by the large average appreciation of the foreign exchange value of the U.S. dollar against the currencies of a broad group of major countries between 2008 and 2009.

[11] The 17 industries and their corresponding BEA codes are: Mining (21), Utilities (22), Food (311), Chemicals (325), Primary and fabricated metals (331-332), Machinery (333), Computer and electronic products (334), Electrical equipment, appliances, and components (335), Transportation equipment (336), Other manufacturing (312-324, 326-327, 337-339), Wholesale trade (42), Retail trade (44-45), Information (51), Depository institutions (5221), Finance and insurance (52, excluding 5221), Professional, scientific, and technical services (54), Other industries (55-99).

sures firms' requirements for outside capital. We call this measure $EXTERNALFINANCE$ (i.e. external finance dependence). We measure access to buyer-supplier trade credit using the ratio of the change in accounts payable to the change in total assets. This measure, which we call $TRADECREDIT$, reflects how much credit firms receive in lieu of having to make upfront or spot payments (see Fisman and Love, 2003). Finally, we construct a measure of asset tangibility similar to Claessens and Laeven (2003), as the one minus the share of net plant, property and equipment in total book-value assets. This measure, which we call $TANGIBILITY$, reflects firms' ability to pledge collateral in securing external finance.[12] Each measure of financial vulnerability is calculated at the firm level as the average value over the 1999-2005 period. We use the median value across firms in each NAICS industry as a vulnerability measure for the industry.

Although the time period that we analyze and the industry classification that we use are different from those of Chor and Manova (2012), some of the industries overlap. For these industries the correlations between our measures of financial vulnerability and Chor and Manova's range between 0.74 and 0.98. The three industries for which external finance dependence is particularly large are computer and electronic products, chemicals, and depository institutions. The three industries with the lowest external finance dependence are: food, other manufacturing, and machinery. The industries that rely more on trade credit are wholesale trade; retail trade; and electrical equipment, appliances, and components. The three industries that have more intangible assets are finance and insurance; information; and professional, scientific, and technical services. Our measures rank industries similarly to the existing literature.

Factor Intensity Measures. Similar to Chor and Manova (2012), we compute measures of industry factor intensities, $log\left(\kappa_k/l_k\right)$ (physical capital intensity) and $log\left(h_k/l_k\right)$ (skill intensity). These variables are available from the NBER-CES database for manufacturing industries and Standard Industrial Classification (SIC) 4-digit industries.[13] We use less dis-

[12]Industries with more hard assets can usually offer greater collateral to secure loans, and therefore should be less sensitive to adverse credit conditions. $TANGIBILITY$, which in our work increases as the share of hard assets declines, can be seen as a direct proxy for financial vulnerability.

[13]The NBER-CES database is a joint effort between the National Bureau of Economic Research and the U.S. Census Bureau's Center for Economic Studies.

aggregated data at the NAICS 2-digit level. These measures are not readily available for a nonnegligible number of service industries. Physical capital intensity is the natural logarithm of the ratio between real capital stock and total employment. Skill intensity is the logarithm of the ratio of nonproduction workers to total employment. We discard the option of using Compustat data for κ_k/l_k, as Leonardi (2007) shows huge intra-industry dispersion for this measure. Instead we use industry-level BEA data.[14] We consider Current-Cost Net Stock of Private Fixed Assets by Industry (Table 3.1ES) and the Chain-Type Quantity Indexes for Investment in Private Fixed Assets by Industry as an industry-specific deflator (National Income Product Accounts, NIPA, Table 3.8ES) to calculate κ_k. Moreover, we use a measure of Full-Time Equivalent Employees by Industry (Table 6.5D). The NBER-CES database allows the derivation of the skill-ratio h_k/l_k as the ratio between nonproduction workers and total workers. Here we use Bureau of Labor Statistics (BLS) data on employees on nonfarm payrolls by industry and selected industry detail (Table B-1) and data on employment of production and nonsupervisory employees on private nonfarm payrolls by industry sector (Table B-6).[15] Annual measures are computed using seasonally adjusted data averaged over 12 months.

2.2 Country-Level Variables and Other Data

Cost of Financing. Chor and Manova (2012) use interbank rates from the Thompson dataset. We opt for two interest rates from the Organisation for Economic Co-operation and Development (OECD) statistical database: an immediate rate (*Im Rate*) and a short-term rate for each country and year in the sample. Immediate rates are generally overnight interbank rates or rates corresponding to very short-term transactions when interbank rates are not available. Short-term rates are interbank rates on loans with a maturity between 1 and 3 months. When interbank rates are not available for these maturities, the OECD database reports yields on the country's treasury bills.[16]

[14] `http://www.bea.gov/national/FA2004/SelectTable.asp`.

[15] Data Retrieval: Employment, Hours, and Earnings (CES): Table B-1 (`http://www.bls.gov/webapps/legacy/cesbtab1.htm`) and Table B-6 (`http://www.bls.gov/webapps/legacy/cesbtab6.htm`).

[16] See OECD statistics (`http://stats.oecd.org/Index.aspx`).

Country-Level Measures of Factor Abundance. We compute the natural logarithm of the ratio between a measure of highly skilled labor endowment (H) and total labor force (L), where $H/L = exp(\phi(s))$, s is the average years of schooling in the population over 25 years of age taken from the Barro-Lee dataset (Barro and Jong-Wha, 2011), and $\phi(\cdot)$ is a piecewise linear function with a slope of 0.13 for $s < 4$, 0.10 for $4 < s < 8$, and 0.07 for $s > 8$ (see Chor and Manova, 2012). The log of the capital-to-labor ratio is from Barseghyan and DiCecio (2011). Both measures are computed as averages over the 1999-2005 period.

Nominal Exchange Rates, Industrial Production Index. Both annual series are obtained from the International Financial Statistics dataset of the International Monetary Fund (IMF).

GDP. Initial conditions for real GDP and real GDP per capita (constant purchasing power parity dollars at 2005 prices) are calculated as averages over the 1999-2005 period. Data are from the World Development Indicators of the World Bank.

U.S. Retail Sales. We collect annual data on total retail sales for the 1999-2009 period from the U.S. Census Bureau.

Total Commercial and Industrial Loans. Data for commercial and industrial loans at all commercial banks over 1999-2010 (annual data) are collected from the H.8 release (Assets and Liabilities of Commercial Banks in the U.S.) of the Board of Governors of the Federal Reserve System.

3 Empirical Strategy

We investigate whether credit conditions can explain the evolution of U.S. inward FDI. The economic concept is that countries with higher financing costs are likely to invest relatively less in those U.S. sectors that are more heavily dependent on external finance. We exploit the cross-industry and cross-country variation in our annual dataset to isolate the effect of credit conditions on U.S. inward FDI from the other potential determinants.

As in Chor and Manova (2012), we consider the three measures of financial vulnerability described above. FDI series occasionally exhibit negative values or zero entries. In some cases,

negative values may be due to either underreporting or large disinvestment. The latter is often caused by repatriation of previous investment. In a linear regression model framework, using the logarithm of capital flows to reduce the weight of observations with particularly large values is thus not always a viable solution. A semi-logarithmic transformation would deal with the zero entries but would not solve the issue of negative observations. Following Levy-Yeyati, Panizza, and Stein (2007), we transform the inward FDI data as

$$inFDI^{*}_{ikt} = sign\left(inFDI_{ikt}\right) \times \log\left(1 + |inFDI_{ikt}|\right)$$

and then estimate the model that follows using a measure of financial vulnerability and a type of inward capital flow (total inward FDI, inward equity FDI, and inward debt FDI in industry k from country i) at a time. For example, we estimate

$$\begin{aligned} inFDItot^{*}_{ikt} = {} & \beta_1 \left(Im\ Rate_{it} \times EXTERNALFINANCE_k\right) \\ & + \beta_2 \left(Im\ Rate_{it} \times Crisis \times EXTERNALFINANCE_k\right) \\ & + D_{it} + D_{kt} + D_{ik} + \epsilon_{ikt}, \end{aligned}$$

where $Crisis$ is a dummy variable for the financial crisis, which is equal to 1 in 2008 and 2009; and D_{it}, D_{kt}, and D_{ik} are, respectively, country-year, industry-year, and country-industry fixed effects. As robustness checks, we consider alternative versions of the model above in which we exclude some of the fixed effects and/or include factor endowment controls, initial size and income controls, industrial production index controls, and/or exchange rate controls. In some instances, the crisis dummy in the interaction term of the equation is replaced by U.S. retail sales, U.S. commercial and industrial loans, or both. In a few cases, we exclude all measures of financial vulnerability from the model specification. See the Results section and the notes to the tables with the regression outputs for further details.

The coefficients β_1 and β_2 are of main interest. β_1 describes the effect of the fluctuations in countries' costs of capital on the sectoral composition of inward FDI. The expectation is

that inward FDI flows to financially dependent domestic sectors are relatively smaller when they come from countries that experience higher interbank rates. β_2 describes the variation in this effect during the two years of the financial crisis. The wide set of fixed effects in the model specification allows the identification of β_1 and β_2 from (1) the dispersion in financial dependence across industries within a given country-year pair, (2) the variation in the cost of credit across source countries in a given industry-year pair, and (3) the variation in the cost of finance over time within a given country-industry pair. Such an extensive set of fixed effects potentially mitigates problems of omitted-variable bias and allows us to isolate a plausibly causal effect of credit conditions on FDI flows during the financial crisis. Nevertheless, in the next section we describe alternative model specifications with additional controls as a robustness check for our results.

4 Results

When we study the properties of the equity component of inward FDI ($inFDIeq$), the variations in the association between the flows and the measures of cost of capital during the peak of the financial crisis (2008 and 2009) are almost always statistically significant. In Table 2 we show that, during the crisis, countries with higher immediate rates tend to provide relatively higher FDI equity inflows to U.S. sectors with a greater requirement for external finance with respect to the non-crisis periods in the sample. Furthermore, countries with higher immediate rates tend to provide relatively lower FDI equity inflows to U.S. industries with a greater intensity in intangible assets with respect to the non-crisis periods. These variations are significant and of the same sign when we replace the immediate rate with the short-term rate in the model specifications (Table 4). We also find evidence that, during the financial distress, source countries with higher short-term rates tend to provide relatively lower FDI equity inflows to the U.S. industries with a greater degree of access to trade credit. The variations are significant, although with inverted signs, when we use $Im\ Spread$, the difference between the immediate rate and the short-term rate, as a cost of capital measure (see Table 3).

In Table 5 the intuition is similar. This time, the crisis measure is not a simple dummy variable, but two continuous variables: U.S. retail sales and U.S. loans. We estimate a significantly negative relationship between immediate rates in the source countries and the FDI equity inflows to U.S. sectors with a greater requirement for external finance. The magnitude of this association significantly drops in absolute terms as U.S. loans increase. U.S. loans decrease during the crisis; therefore, the negative association between FDI equity inflows and immediate rates becomes more pronounced in those two years. Furthermore, we detect a significantly positive association between immediate rates in the source countries and the FDI equity inflows to U.S. industries with a greater degree of access to trade credit. This association becomes significantly weaker as U.S. loans increase. U.S. loans contract during the crisis and therefore such a positive association becomes even more pronounced in the 2008-2009 period. In Table 6, we report a significantly negative link between the immediate rates in the source countries and U.S. FDI equity inflows, which does not change significantly during the financial crisis.

With inward debt flows ($inFDIdebt$), the variations in the relationship between such flows and the measures of cost of capital during the financial crisis are often statistically significant. We find statistically significant variations when we use external finance dependence as a measure of financial vulnerability. According to the results in Tables 7, 9, and 11, during the crisis, countries with higher immediate and short-term rates tend to provide relatively lower FDI debt inflows to U.S. industries with a greater requirement for external finance. In 2008 and 2009, countries with higher spreads provide on average relatively higher FDI debt inflows to U.S. sectors with a greater requirement for external finance (Table 8). Table 10 shows that immediate rates and U.S. FDI debt inflows are negatively associated for given requirements for external finance. This negative association significantly declines in absolute value (so it shrinks to zero) as U.S. retail sales increase. Given that U.S. retail sales decrease during the crisis, such a negative association becomes even more pronounced in that period of time.

Effects and variations are generally not statistically significant, and therefore results are unreported, in the case of aggregate FDI flows. However, we find a significantly negative

relationship between total flows and immediate rates. This relationship, which does not seem to be robust to the inclusion of financial vulnerability measures in the model specification, tends to remain stable in 2008 and 2009.

5 Conclusions

In this article we document the contraction of inward FDI flows in the U.S. at the beginning of 2009. Such a decline is unusual relative to the other countries that experienced financial crises in the past. In the other crises, FDI generally appears resilient to the economic conditions of the host economy, in the sense that it tends to remain stable or even increase during downturns. The lack of resiliency in the United States might depend on push factors and on the global nature of the economic recession, which influenced the cost of funding FDI flows in the economies where these flows originate.

To study the specific effects of financial vulnerability on FDI, we use a three-dimensional annual panel of U.S. inward FDI flows organized by recipient U.S. industries, source countries, and years for the recorded flows. Variations in the cost of finance in the source countries have little or no effect on the total FDI inflows. However, we find evidence that the industries in the Unites States that are more financially vulnerable experienced significant shifts in FDI equity and debt inflows during the latest financial crisis, following the changes in the cost of capital that occurred in the source economies. Our results suggest that studying the properties of the individual components of FDI is more desirable than using total flows if the goal is to better understand the evolution of international capital flows over time and their determinants.

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Appendix

U.S. FDI Breakdown by Components

The BEA statistics break down U.S. FDI flows into four components, which we describe in the case of outbound flows. Symmetric arguments apply to the inbound flows.

Equity. The equity of U.S. parent firms in incorporated foreign affiliates consists of the U.S. parents' holdings of capital stock in, and other capital contributions to, their affiliates. Capital stock consists of all stock of affiliates, whether common or preferred, voting or nonvoting. Other capital contributions by U.S. parents consist of (1) capital, invested or contributed, that is not included in capital stock (such as the amounts paid for stock in excess of its par or stated value) and (2) capitalizations of intercompany accounts (conversions of debt to equity) that do not result in the issuance of capital stock.

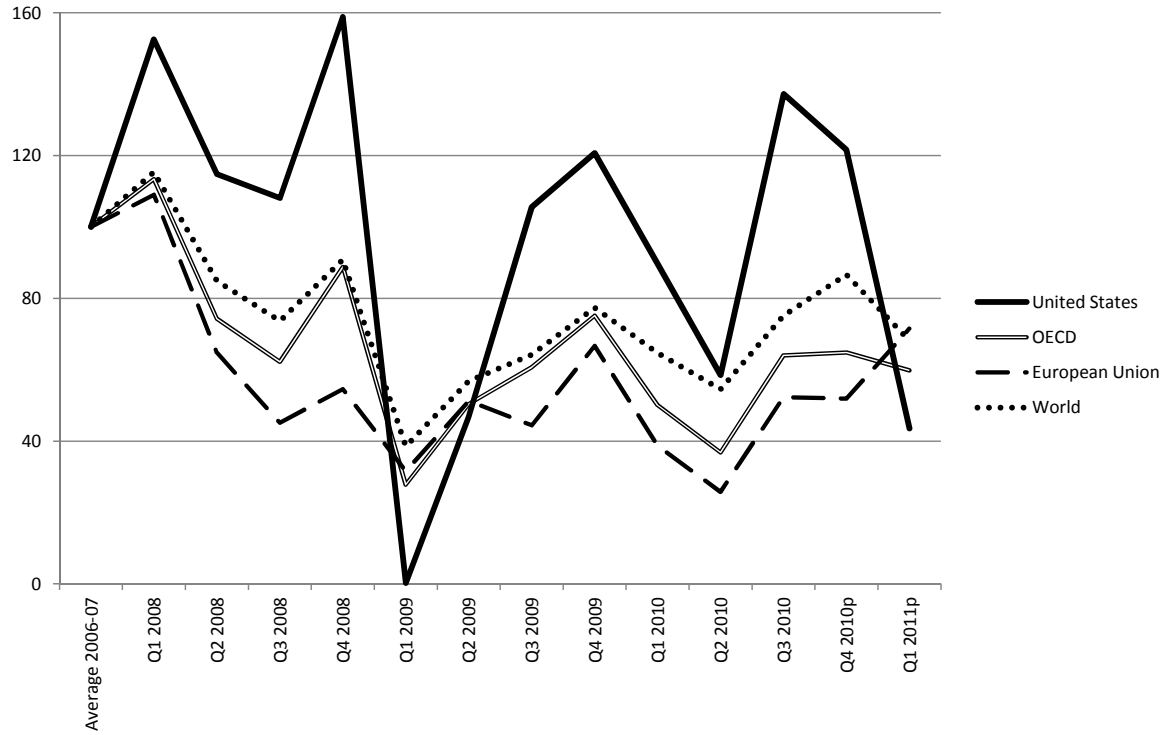
Intercompany Debt. Intercompany debt flows consist of the change in the U.S. parents' net intercompany debt due from their foreign affiliates during a certain period. The quarterly change is derived by subtracting the net outstanding intercompany debt balance at the end of the previous quarter from the net outstanding balance at the end of the current quarter. The net balance at the end of a quarter (or year) is calculated as the U.S. parents' receivables less U.S. parents' payables. When a U.S. parent lends funds to its foreign affiliate, the balance of the parent's receivables (amounts due) from the affiliate increases; subsequently, when the affiliate repays the principal owed to its U.S. parent, the balance of the U.S. parent's receivables from the affiliate is reduced. Similarly, when a U.S. parent borrows funds from its foreign affiliate, the balance of the U.S. parent's payables (amounts owed) to the affiliate increases; subsequently, when the U.S. parent repays the principal owed to its affiliate, the balance of the U.S. parent's payables to the affiliate is reduced.

Reinvested Earnings. Reinvested earnings of foreign affiliates are calculated as total earnings less distributed earnings. Earnings are the shares of U.S. parents in the net income of their foreign affiliates after provision for foreign income taxes. Earnings are from the books of the foreign affiliate. A U.S. parent's share in net income is based on its directly held equity

interest in the foreign affiliate. Reinvested earnings are shown as a separate component of direct investment financial flows in recognition of the fact that the earnings of an affiliate are income to the U.S. parent, regardless of whether they are reinvested or remitted to the parent. However, reinvested earnings are not actually transferred to the U.S. parent but increase the parent's investment in its affiliate.

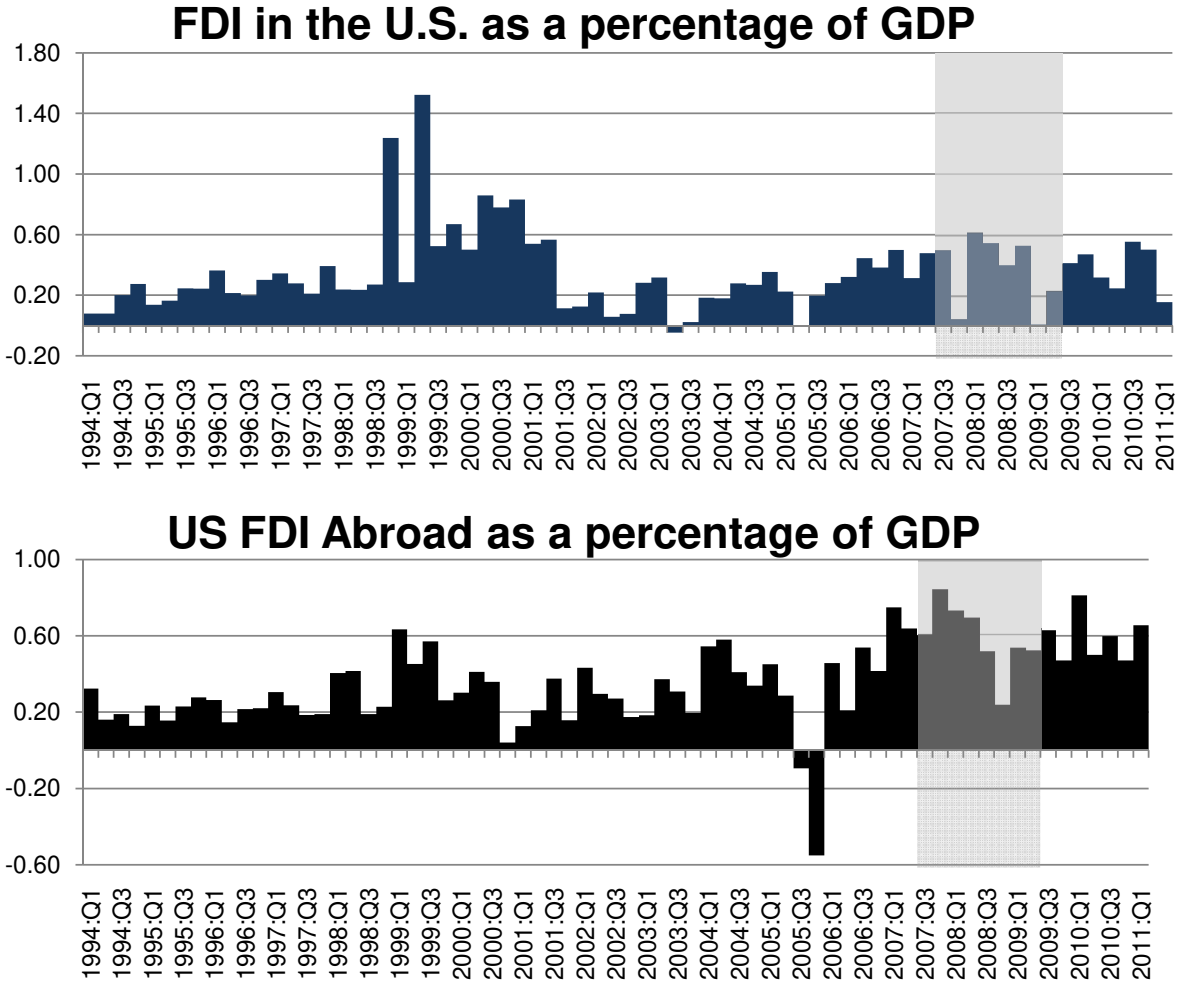
Valuation Adjustments. They account for changes in the value of financial assets.

Figure 1: Quarterly Inward FDI in the United States, the European Union, the OECD, and the World



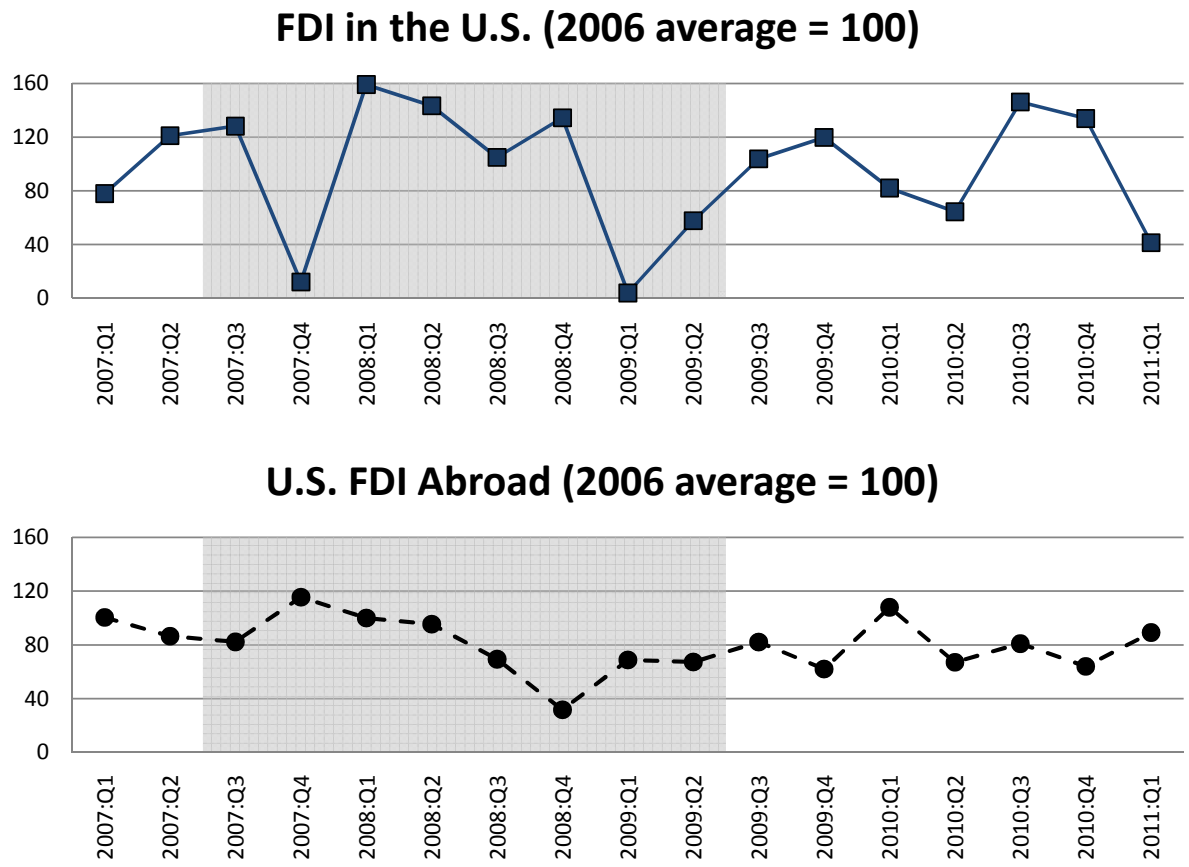
Note: Inward FDI for the United States, OECD countries, the World, and the European Union. The first observation for each geographic aggregate is the average of its quarterly flows in 2006-2007 normalized to 100. Source: OECD Directorate for Financial and Enterprise Affairs, Investment Division.

Figure 2: U.S. FDI abroad and foreign FDI in the United States as a share of U.S. GDP (1994:Q1-2011:Q1)



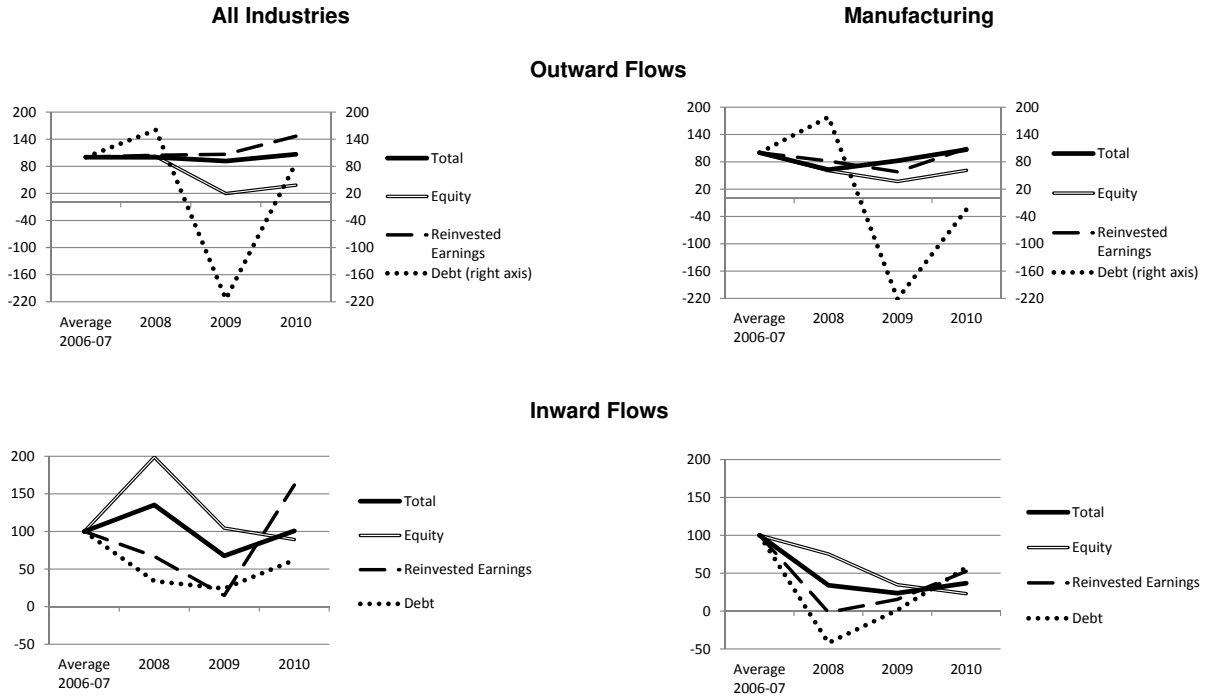
Note: Quarterly U.S. inward and outward FDI flows between 1994:Q1 and 2011:Q1. Flows are reported as percentages of quarterly GDP. The gray areas represent the financial crisis of 2007-2009. Source: Authors' calculations based on BEA data.

Figure 3: U.S. FDI abroad and foreign FDI in the United States, 2007:Q1-2011:Q1, relative to average pre-crisis flows



Note: Quarterly inward and outward FDI for the United States normalized to the pre-crisis level. The average of the quarterly flows in 2006-2007 is set equal to 100. Source: Authors' calculations based on BEA data.

Figure 4: Outward and intward FDI by component, as a share of the average 2006-2007 flows.



Note: Annual inward and outward FDI for the United States normalized to the pre-crisis level. The average of the quarterly flows in 2006-2007 is set equal to 100. The two graphs on the left report data for all industries, the two graphs on the right report data for only manufacturing industries. The two top graphs report outflows, the two bottom graphs report inflows. Total FDI and its three major components (equity, reinvested earnings, and debt) are reported. Source: Authors' calculations based on BEA data.

Table 1: Major investors in the United States: Sum of FDI flows in 2006 and 2007 and FDI stocks in 2006 (Millions of U.S. Dollars)

		FDI Outflows					FDI Inflows		
	Destination Country	Share (2006 + 2007, %)	Cumulative Share (%)	Stock (2006)		Origin Country	Share (2006 + 2007, %)	Cumulative Share (%)	Stock (2006)
1	Netherlands	25.45	25.45	279,373	1	United Kingdom	15.64	15.64	414,629
2	United Kingdom	8.90	34.34	406,358	2	Canada	14.33	29.96	165,281
3	Luxembourg	7.10	41.44	125,146	3	Netherlands	12.59	42.55	182,014
4	Ireland	6.04	47.48	86,372	4	Japan	9.19	51.74	204,020
5	Bermuda	5.88	53.36	133,480	5	France	8.53	60.27	147,799
6	Singapore	3.73	57.10	81,879	6	Luxembourg	8.30	68.57	89,157
7	Canada	3.52	60.62	205,134	7	Germany	6.56	75.13	205,969
8	Mexico	3.26	63.88	82,965	8	Sweden	4.38	79.51	20,098
9	France	3.23	67.11	63,008	9	Belgium	3.27	82.77	11,691
10	Japan	3.12	70.23	84,428	10	UK Caribbeans	2.97	85.74	28,367
11	Switzerland	3.11	73.35	102,022	11	Italy	2.13	87.87	9,299
12	Hong Kong	2.66	76.01	39,636	12	Australia	1.99	89.86	38,777
13	Germany	2.08	78.09	93,620	13	Singapore	1.98	91.84	6,458
14	Australia	1.96	80.05	67,632	14	South Korea	1.96	93.81	9,459
15	Belgium	1.94	81.99	51,862	15	Spain	1.75	95.56	13,969
16	China	1.60	83.59	26,459	16	Ireland	1.60	97.16	25,517
17	Spain	1.39	84.98	49,356	17	Panama	0.65	97.80	11,924
18	Italy	1.12	86.10	25,435	18	Mexico	0.62	98.43	5,310
19	UK Caribbeans	1.06	87.16	84,817	19	Bermuda	0.54	98.96	9,223
20	Brazil	0.98	88.14	33,504	20	Neth. Antilles	0.35	99.31	4,675
21	India	0.97	89.12	9,746	21	Denmark	0.26	99.57	6,726
22	Sweden	0.84	89.96	33,857	22	Hong Kong	0.11	99.69	2,992
23	Chile	0.82	90.78	10,927	23	Taiwan	0.10	99.79	4,064
24	Argentina	0.82	91.60	13,174	24	Austria	0.10	99.89	2,305
25	Russia	0.75	92.35	11,371	25	New Zealand	0.07	99.96	559
26	Turkey	0.68	93.02	3,141	26	Bahamas	0.02	99.98	513
27	Indonesia	0.63	93.65	9,484	27	Malaysia	0.01	99.99	488
28	South Korea	0.57	94.21	27,299	28	Brazil	0.01	100.00	1,054
29	Taiwan	0.56	94.77	16,999					
30	Israel	0.50	95.27	9,168					

Table 2: Estimation Results for the Equity Component of Inward FDI (1)

Dependent Variable: Logarithmic transformation of inFDIequi			
Financial Vulnerability Measure:	EXTERNALFINANCE	TRADECREDIT	TANGIBILITY
	(1)	(2)	(3)
Im Rate × Fin Vuln	-0.0117	-0.347	0.186
	(0.0599)	(0.448)	(0.127)
Crisis × Im Rate × Fin Vuln	**0.0259****	-0.163	**-0.0873***
	(0.0112)	(0.112)	(0.0486)
Factor Endowments Controls	Y	Y	Y
Initial Size and Income Controls	Y	Y	Y
Cty-Ind, Cty-Year, Ind-Year FEs	Y	Y	Y
Observations	1,554	1,554	1,554
R^2	0.528	0.529	0.529

Standard errors (in parentheses) are clustered by country; ***, **, and * denote significance at the 1%, 5%, and 10% levels. Bold figures are significant at least at the 10% level. All specifications include country-industry, country-year, and industry-year fixed effects. The Crisis variable is an indicator equal to 1 in 2008 and 2009. All specifications also include factor endowment controls (Crisis × Log(K/L) × Log(k/l)and Crisis × Log(H/L) × Log(h/l)) and country size and income controls (Crisis × Log(GDP) × Industry fixed effects and Crisis × Log(GDPpc) × Industry fixed effects). Sample is 2006-2010.

Table 3: Estimation Results for the Equity Component of Inward FDI (2)

Dependent variable: Logarithmic transformation of inFDIequi						
Financial Vulnerability Measure:	EXTERNALFINANCE		TRADECREDIT		TANGIBILITY	
	(1)	(2)	(3)	(4)	(5)	(6)
Cost of Capital Measure:	Im Spread = Im Rate - Short-Term Rate					
Im Spread × Fin Vuln	0.00446	0.0174	-0.248	**-0.430****	0.0406	-0.0477
	(0.0232)	(0.0200)	(0.195)	(0.169)	(0.0766)	(0.0831)
Crisis × Im Spread × Fin Vuln	**-0.00307***	**-0.00553*****	**0.0422*****	**0.0478****	-0.0128	**0.0137***
	(0.00172)	(0.00170)	(0.0136)	(0.0183)	(0.00908)	(0.00661)
Factor Endowments Controls	N	Y	N	Y	N	Y
Initial Size and Income Controls	N	Y	N	Y	N	Y
Cty-Ind, Cty-Year, Ind-Year FEs	Y	Y	Y	Y	Y	Y
Observations	1,862	1,540	1,862	1,540	1,862	1,540
R^2	0.499	0.530	0.499	0.531	0.499	0.530

Standard errors (in parentheses) are clustered by country; ***, **, and * denote significance at the 1%, 5%, and 10% levels. Bold figures are significant at least at the 10% level. All specifications include country-industry, country-year, and industry-year fixed effects. The Crisis variable is an indicator equal to 1 in 2008 and 2009. The second specification for each measure of financial vulnerability also includes factor endowment controls (Crisis × Log(K/L) × Log(k/l) and Crisis × Log(H/L) × Log(h/l)) and country size and income controls (Crisis × Log(GDP) × Industry fixed effects and Crisis × Log(GDPpc) × Industry fixed effects). Sample is 2006-2010.

Table 4: Estimation Results for the Equity Component of Inward FDI (3)

Dependent variable: Logarithmic transformation of inFDIequi			
Financial Vulnerability Measure:	EXTERNALFINANCE	TRADECREDIT	TANGIBILITY
	(1)	(2)	(3)
Cost of Capital Measure:	Short-Term Rate		
Short-Term Rate × Fin Vuln	-0.0191	0.173	0.115
	(0.0392)	(0.347)	(0.133)
Crisis × Short-Term Rate × Fin Vuln	**0.00479*****	**-0.0321***	**-0.0139***
	(0.00164)	(0.0158)	(0.00705)
Factor Endowments Controls	Y	Y	Y
Initial Size and Income Controls	Y	Y	Y
Cty-Ind, Cty-Year, Ind-Year FEs	Y	Y	Y
Observations	1,540	1,540	1,540
R^2	0.530	0.530	0.530

Standard errors (in parentheses) are clustered by country; ***, **, and * denote significance at the 1%, 5%, and 10% levels. Bold figures are significant at least at the 10% level. The Crisis variable is an indicator equal to 1 in 2008 and 2009. All specifications include country-industry, country-year, industry-year fixed effects, factor endowment controls (Crisis × Log(K/L) × Log(k/l)and Crisis × Log(H/L) × Log(h/l)), and country size and income controls (Crisis × Log(GDP) × Industry fixed effects and Crisis × Log(GDPpc) × Industry fixed effects). Sample is 2006-2010.

Table 5: Estimation Results for the Equity Component of Inward FDI (4)

Dependent variable: Logarithmic transformation of inFDIequi						
Financial Vulnerability Measure:	EXTERNALFINANCE			TRADECREDIT		
	(1)	(2)	(3)	(4)	(5)	(6)
Crisis Measure:	US Retails	US Loans	Joint Test	US Retails	US Loans	Joint Test
Im Rate × Fin Vuln	-6.290	**-1.028****	-6.192	41.63	**8.069*****	38.65
	(5.040)	(0.463)	(5.164)	(39.48)	(2.804)	(40.71)
log(US Retails) × Im Rate × Fin Vuln	0.416		0.400	-2.763		-2.263
	(0.334)		(0.362)	(2.600)		(2.864)
log(US Loans) × Im Rate × Fin Vuln		**0.143***	0.0201		**-1.183*****	-0.640
		(0.0700)	(0.132)		(0.382)	(0.684)
Factor Endowments Controls	Y	Y	Y	Y	Y	Y
Initial Size and Income Controls	Y	Y	Y	Y	Y	Y
Cty-Ind, Cty-Year, Ind-Year FEs	Y	Y	Y	Y	Y	Y
Observations	1,246	1,554	1,246	1,246	1,554	1,246
R^2	0.585	0.529	0.585	0.585	0.529	0.585

Standard errors (in parentheses) are clustered by country; ***, **, and * denote significance at the 1%, 5%, and 10% levels. Bold figures are significant at least at the 10% level. The Crisis variable is an indicator equal to 1 in 2008 and 2009. All specifications include country-industry, country-year, industry-year fixed effects, factor endowment controls (Crisis × Log(K/L) × Log(k/l) and Crisis × Log(H/L) × Log(h/l)), and country size and income controls (Crisis × Log(GDP) × Industry fixed effects and Crisis × Log(GDPpc) × Industry fixed effects). Sample is 2006-2010.

Table 6: Estimation Results for the Equity Component of Inward FDI (5)

Dependent variable: Logarithmic transformation of inFDIequi				
	(1)	(2)	(3)	(4)
Im Rate	**-0.0911*****	**-0.0788****	-0.0380	**-0.0967*****
	(0.0324)	(0.0367)	(0.0307)	(0.0280)
Crisis × Im Rate	-0.0173	-0.0406	-0.0232	-0.0540
	(0.0351)	(0.0465)	(0.0346)	(0.0496)
Factor Endowments Controls	N	Y	Y	Y
Initial Size and Income Controls	N	N	Y	Y
IPI Controls	N	N	N	Y
Ind-Year FEs	Y	Y	Y	Y
Observations	1,950	1,950	1,950	1,665
R^2	0.137	0.145	0.163	0.192

Standard errors (in parentheses) are clustered by country; ***, **, and * denote significance at the 1%, 5%, and 10% levels. Bold figures are significant at least at the 10% level. The Crisis variable is an indicator equal to 1 in 2008 and 2009. All specifications include industry-year fixed effects and control for the log bilateral exchange rate (EXCH) and Crisis × Log(EXCH). The specifications in columns (2)-(4) also control for Log(K/L), Crisis × Log(K/L), Log(H/L), and Crisis × Log(H/L). The specifications in columns (3)-(4) also control for Log(GDP), Crisis × Log(GDP), Log(GDPpc), and Crisis × Log(GDPpc). The specification in column (4) further includes Log(Industrial Production Index) and Crisis × Log(Industrial Production Index). Sample is 2006-2010.

Table 7: Estimation Results for the Debt Component of Inward FDI (1)

Dependent variable: Logarithmic transformation of inFDIdebt			
Financial Vulnerability Measure:	EXTERNALFINANCE	TRADECREDIT	TANGIBILITY
	(1)	(2)	(3)
Im Rate × Fin Vuln	0.0208	0.144	0.158
	(0.0552)	(0.256)	(0.359)
Crisis × Im Rate × Fin Vuln	**-0.0150***	-0.0162	-0.152
	(0.00787)	(0.108)	(0.177)
Factor Endowments Controls	Y	Y	Y
Initial Size and Income Controls	Y	Y	Y
Cty-Ind, Cty-Year, Ind-Year FEs	Y	Y	Y
Observations	1,554	1,554	1,554
R^2	0.301	0.301	0.301

Standard errors (in parentheses) are clustered by country; ***, **, and * denote significance at the 1%, 5%, and 10% levels. Bold figures are significant at least at the 10% level. All specifications include country-industry, country-year, and industry-year fixed effects. The Crisis variable is an indicator equal to 1 in 2008 and 2009. All specifications also include factor endowment controls (Crisis × Log(K/L) × Log(k/l) and Crisis × Log(H/L) × Log(h/l)) and country size and income controls (Crisis × Log(GDP) × Industry fixed effects and Crisis × Log(GDPpc) × Industry fixed effects). Sample is 2006-2010.

Table 8: Estimation Results for the Debt Component of Inward FDI (2)

Dependent variable: Logarithmic transformation of inFDIdebt						
Financial Vulnerability Measure:	EXTERNALFINANCE		TRADECREDIT		TANGIBILITY	
	(1)	(2)	(3)	(4)	(5)	(6)
Cost of Capital Measure:	Im Spread = Im Rate - Short-Term Rate					
Im Spread × Fin Vuln	0.0352	0.0277	0.123	0.155	-0.176	-0.167
	(0.0275)	(0.0285)	(0.0784)	(0.0958)	(0.153)	(0.188)
Crisis × Im Spread × Fin Vuln	**0.00366****	**0.00470***	-0.00227	0.00131	0.0106	0.00209
	(0.00147)	(0.00252)	(0.00899)	(0.0114)	(0.0108)	(0.0137)
Factor Endowments Controls	N	Y	N	Y	N	Y
Initial Size and Income Controls	N	Y	N	Y	N	Y
Cty-Ind, Cty-Year, Ind-Year FEs	Y	Y	Y	Y	Y	Y
Observations	1,862	1,540	1,862	1,540	1,862	1,540
R^2	0.262	0.301	0.262	0.301	0.262	0.302

Standard errors (in parentheses) are clustered by country; ***, **, and * denote significance at the 1%, 5%, and 10% levels. Bold figures are significant at least at the 10% level. All specifications include country-industry, country-year, and industry-year fixed effects. The Crisis variable is an indicator equal to 1 in 2008 and 2009. The second specification for each measure of financial vulnerability also includes factor endowment controls (Crisis × Log(K/L) × Log(k/l) and Crisis × Log(H/L) × Log(h/l)) and country size and income controls (Crisis × Log(GDP) × Industry fixed effects and Crisis × Log(GDPpc) × Industry fixed effects). Sample is 2006-2010.

Table 9: Estimation Results for the Debt Component of Inward FDI (3)

Dependent variable: Logarithmic transformation of inFDIdebt			
Financial Vulnerability Measure:	EXTERNALFINANCE	TRADECREDIT	TANGIBILITY
	(1)	(2)	(3)
Cost of Capital Measure:		Short-Term Rate	
Short-Term Rate × Fin Vuln	-0.00953	-0.0526	0.181
	(0.0143)	(0.132)	(0.169)
Crisis × Short-Term Rate × Fin Vuln	**-0.00427****	-0.00433	-0.00821
	(0.00181)	(0.0106)	(0.0179)
Factor Endowments Controls	Y	Y	Y
Initial Size and Income Controls	Y	Y	Y
Cty-Ind, Cty-Year, Ind-Year FEs	Y	Y	Y
Observations	1,540	1,540	1,540
R^2	0.301	0.301	0.302

Standard errors (in parentheses) are clustered by country; ***, **, and * denote significance at the 1%, 5%, and 10% levels. Bold figures are significant at least at the 10% level. The Crisis variable is an indicator equal to 1 in 2008 and 2009. All specifications include country-industry, country-year, industry-year fixed effects, factor endowment controls (Crisis × Log(K/L) × Log(k/l) and Crisis × Log(H/L) × Log(h/l)), and country size and income controls (Crisis × Log(GDP) × Industry fixed effects and Crisis × Log(GDPpc) × Industry fixed effects). Sample is 2006-2010.

Table 10: Estimation Results for the Debt Component of Inward FDI (4)

Dependent variable: Logarithmic transformation of inFDIdebt						
Financial Vulnerability Measure:	EXTERNALFINANCE			TRADECREDIT		
	(1)	(2)	(3)	(4)	(5)	(6)
Crisis Measure:	US Retails	US Loans	Joint Test	US Retails	US Loans	Joint Test
Im Rate × Fin Vuln	**-12.24***	-0.297	**-12.11***	45.76	1.734	47.90
	(5.966)	(0.410)	(5.967)	(41.07)	(2.009)	(42.26)
log(US Retails) × Im Rate × Fin Vuln	**0.808***		**0.786***	-3.016		-3.375
	(0.394)		(0.387)	(2.701)		(2.862)
log(US Loans) × Im Rate × Fin Vuln		0.0438	0.0277		-0.223	0.459
		(0.0578)	(0.0494)		(0.278)	(0.416)
Factor Endowments Controls	Y	Y	Y	Y	Y	Y
Initial Size and Income Controls	Y	Y	Y	Y	Y	Y
Cty-Ind, Cty-Year, Ind-Year FEs	Y	Y	Y	Y	Y	Y
Observations	1,246	1,554	1,246	1,246	1,554	1,246
R^2	0.367	0.301	0.367	0.366	0.301	0.366

Standard errors (in parentheses) are clustered by country; ***, **, and * denote significance at the 1%, 5%, and 10% levels. Bold figures are significant at least at the 10% level. The Crisis variable is an indicator equal to 1 in 2008 and 2009. All specifications include country-industry, country-year, industry-year fixed effects, factor endowment controls (Crisis × Log(K/L) × Log(k/l) and Crisis × Log(H/L) × Log(h/l)), and country size and income controls (Crisis × Log(GDP) × Industry fixed effects and Crisis × Log(GDPpc) × Industry fixed effects). Sample is 2006-2010.

Table 11: Estimation Results for the Debt Component of Inward FDI (5)

Dependent variable: Logarithmic transformation of inFDIdebt				
	(1)	(2)	(3)	(4)
Im Rate	-0.0182	0.000690	0.00790	0.000726
	(0.0293)	(0.0347)	(0.0342)	(0.0390)
Crisis × Im Rate	-0.0157	**-0.0658***	**-0.0681****	**-0.0733***
	(0.0309)	(0.0359)	(0.0323)	(0.0375)
Factor Endowments Controls	N	Y	Y	Y
Initial Size and Income Controls	N	N	Y	Y
IPI Controls	N	N	N	Y
Ind-Year FEs	Y	Y	Y	Y
Observations	1,950	1,950	1,950	1,665
R^2	0.036	0.037	0.037	0.046

Standard errors (in parentheses) are clustered by country; ***, **, and * denote significance at the 1%, 5%, and 10% levels. Bold figures are significant at least at the 10% level. The Crisis variable is an indicator equal to 1 in 2008 and 2009. All specifications include industry-year fixed effects and control for the log bilateral exchange rate (EXCH) and Crisis × Log(EXCH). The specifications in columns (2)-(4) also control for Log(K/L), Crisis × Log(K/L), Log(H/L), and Crisis × Log(H/L). The specifications in columns (3)-(4) also control for Log(GDP), Crisis × Log(GDP), Log(GDPpc), and Crisis × Log(GDPpc). The specification in column (4) further includes Log(Industrial Production Index) and Crisis × Log(Industrial Production Index). Sample is 2006-2010.