# STOCK MARKET VALUATIONS AND FOREIGN DIRECT INVESTMENT

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## Abstract

We outline and test two theories of foreign direct investment based on capital market mispricing. The "cheap assets" or "fire-sale" theory considers FDI inflows as the purchase of undervalued host country assets, while the "cheap financial capital" theory views FDI outflows as a natural use of the relatively low-cost capital available to overvalued firms in the source country. The results are consistent with the cheap financial capital theory: FDI flows are unrelated to host country stock market valuations, as measured by the aggregate market-to-book-value ratio, but are strongly positively related to source country valuations and negatively related to future source country stock returns, especially when capital account restrictions limit cross-country arbitrage.

# Stock Market Valuations and Foreign Direct Investment

**Abstract**

We outline and test two theories of foreign direct investment based on capital market mispricing. The "cheap assets" or "fire-sale" theory considers FDI inflows as the purchase of undervalued host country assets, while the "cheap financial capital" theory views FDI outflows as a natural use of the relatively low-cost capital available to overvalued firms in the source country. The results are consistent with the cheap financial capital theory: FDI flows are unrelated to host country stock market valuations, as measured by the aggregate market-to-book-value ratio, but are strongly positively related to source country valuations and negatively related to future source country stock returns, especially when capital account restrictions limit cross-country arbitrage.

**I.**      **Introduction**

Since the influential dissertation by Hymer (1960), most of the literature on the determinants of foreign direct investment assumes that international capital markets are integrated and informationally efficient, or at least integrated and efficient enough so that capital-market arbitrage does not have significant power in explaining patterns in FDI flows. Instead this work has focused on the roles of host country market size, production scale economies, shifting comparative advantages, trade and investment barriers, and tax rates.[1] Without denying the importance of those "fundamental" determinants of FDI, this paper reconsiders the role of capital market prices. Specifically, we outline and test theories of how FDI is affected by country-level stock market valuations.

The need to reconsider the role of capital market prices in FDI is evidenced by recent empirical findings, and parallel theoretical developments, which show that the same capital asset can trade at different prices in different markets at a given point in time. For example, Froot and Dabora (1999) study the shares of Royal Dutch, which trades mainly in the US, and Shell Transport, which trades mainly in the UK. Royal Dutch and Shell pay dividends in a 60:40 ratio in accord with a longstanding merger agreement. Were capital markets informationally efficient and integrated, the relative share price would also be fixed at this ratio. In reality, the actual price ratio varies from 36:40 to 66:40 over Froot and Dabora's sample period. Moreover, the relative

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[1] Models of horizontal investment, such as Markusen (1984), predict more investment in larger markets where gains from avoiding trade costs outweigh the costs of building additional capacity. Models of vertical investment, such as Helpman (1984), describe the incentive to locate production to take advantage of factor cost differences. Empirical evidence on these channels include Brainard (1997), Carr, Markusen, and Maskus (2001), Blonigen, Davies, and Head (2003), and Yeaple (2003). Gordon and Hines (2004) survey the literature on the effect of host country tax rates on FDI. A notable exception to the focus on non-financial factors is Froot and Stein (1991). They focus on information problems in financial contracting, but maintain the assumption of globally integrated and informationally efficient markets. We return to this theory, and related empirical studies, later in the paper.

price of Royal Dutch increases when the US market increases relative to the UK market, strongly

suggesting the existence of broad, country-level investor demand pressures.

Given that the share prices of Royal Dutch and Shell are set on two of the best-

functioning capital markets in the world, and that other "Siamese twin" shares display similar

behavior, one must take seriously the possibility that relative mispricing of corporate assets

across international capital markets is fairly widespread.[2] The evidence also raises the possibility

that the dismissal of capital market misvaluation as an influence on FDI may have been

premature.

We outline two basic types of mispricing-driven FDI. The first is a simple "cheap assets"

or "fire sale" theory. In this theory, FDI *inflows* are the purchase of *undervalued host* country

assets. This idea is expressed often in the financial press and has been developed by Shleifer and

Vishny (1992), and especially Krugman (1998) and Aguiar and Gopinath (2004). The second

theory we consider is a "cheap financial capital" theory. Here, FDI *outflows* are viewed as a

natural use of the relatively low-cost financial capital available to *overvalued source* country

firms. To the extent that FDI is cross-border M&A, as opposed to greenfield investment, this

latter theory is an application of Shleifer and Vishny (2003)'s model of misvaluation-driven

acquisitions to a cross-border setting.

After outlining these novel perspectives on FDI in more detail, we test them. We focus on

the relationship between country-level stock market valuations and cross-country FDI patterns.

In some versions of the mispricing-driven FDI theories, stock prices play a direct role as firms

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[2] Rosenthal and Young (1990), Froot and Dabora (1999), and de Jong, Rosenthal, and van Dijk (2004) discuss other
cases of "Siamese twin" shares whose relative price behavior seems best explained by some form of relative market
mispricing. Studies of country closed-end funds by Hardouvelis, La Porta, and Wizman (1994) and Bodurtha, Kim,
and Lee (1995) offer another clean setting in which the valuation of a set of cash flows appears to depend on where
it trades. Bekaert (1995), Bekaert and Harvey (1995), and Henry (2000) find evidence of stock market segmentation
in broader samples of countries and firms. For surveys of the literature on capital market inefficiencies, including
why mispricings are not always arbitraged away, see Shleifer (2000) and Barberis and Thaler (2003).

issue new equity or buy firms abroad with overvalued equity. In others they affect FDI as a consequence of their influence on perceived collateral values which are a determinant of the cost of debt. Our main sample merges the US Bureau of Economic Analysis panel of FDI flows and the extended international stock market valuation and returns data assembled by Fama and French (1998). The BEA panel includes FDI flows between the US and nineteen other countries from 1974 to 2001. For robustness, we also study the mergers and acquisitions component of US FDI in isolation, as well as a larger panel of bilateral FDI flows among twenty countries.

The empirical results tell a consistent story: The cheap assets channel is unimportant, at least as a general determinant of FDI, whereas the cheap financial capital channel may be very important. We start with simple regressions which show that FDI outflows are strongly positively related to the average market-equity-to-book-equity-value ratio of publicly traded firms in the source country, potentially consistent with cheap financial capital, while FDI inflows are unrelated to the market-to-book ratios of host countries, inconsistent with fire sales. These results appear in all three FDI data sets and are robust to various specification choices. Indeed, source country valuations have a statistically stronger effect than almost any of the standard regressors in FDI equations. An initial implication is that the effect of the *ratio* of country-level stock market capitalizations, the "relative wealth" effect documented in Klein and Rosengren (1994) and Dewenter (1995), is actually one-sided, in the direction of the cheap financial capital explanation.

Of course, stock valuations capture not only mispricing but also many other determinants of FDI, so these results are only suggestive. Three further findings, motivated by a fairly general empirical methodology, support the presence of an independent misvaluation effect. First, we apply the logic that mispricings tend to correct over time, and use ex post stock market returns to

instrument for the component of market-to-book that reflects ex ante mispricing. We find that FDI outflows are strongly related to this component. Second, we use the observation that capital controls limit cross-market arbitrage and thus, other things equal, increase the likelihood that an extreme value of market-to-book reflects mispricing. We find that source country valuations indeed have stronger effects in the presence of capital controls. Third, we combine the power of these two approaches. We find that the component of source country market-to-book associated with mispricing has its strongest effect when capital accounts are closed, just as predicted. These findings are consistent with the cheap financial capital story, but they are not implied by theories in which capital markets are integrated and informationally efficient.[3]

In summary, we find new evidence that capital market mispricing, long an ignored factor in the FDI literature, may actually have an important effect on FDI patterns. In particular, the evidence is consistent with a cheap financial capital channel but not a cheap assets channel. One caveat is that, while our data include the majority of world FDI flows, they focus on developed countries. Thus, our results do not necessarily conflict with Aguiar and Gopinath's (2004) evidence of fire sales in a small set of developing countries in a crisis period; they just cast doubt on undervalued assets as a *general* driving force in FDI flows. Overall, the results add some novel hypotheses and robust new facts to the FDI literature. More broadly, they suggest that the literature on how mispricing affects investment and merger activity *within* countries, recently surveyed by Baker, Ruback, and Wurgler (2004), may also shed light on cross-country data.

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[3] For example, although Froot and Stein (1991), among others, consider the effects of information problems in financial contracting, they assume that international capital markets are integrated and efficient at incorporating public information, and they do not make predictions about the relationship between FDI flows and future stock market returns.

The rest of the paper proceeds as follows. Section II describes the mispricing-based theories of FDI. Section III presents the methodology and the data. Section IV contains the empirical results. Section V concludes.


## II.    Two types of mispricing-driven FDI

As mentioned above, most theories of FDI assume integrated and informationally efficient world capital markets, an assumption that contrasts with casual observation as well as the "Siamese twins" and related empirical evidence. Just as any *relative* mispricing of two assets implies that at least one of the assets must be under- or overpriced on an *absolute* basis, one can distinguish two basic types of mispricing-driven FDI: the first emphasizes the undervaluation of the assets being bought, and the second is driven by overvaluation of the buyer. After describing these views of FDI, we explain why multinationals are well positioned to exploit misvaluations.

### A.    *Cheap assets*

The "cheap assets" story views FDI as the (cross-border) purchase of temporarily undervalued assets. To be precise, by undervalued we mean that assets are priced lower than the theoretical, integrated-and-efficient-world-capital-market benchmark price. Undervaluation could follow from a collapse in investor sentiment for host country assets that takes the form of a stock market crash. Alternatively, it could be sparked by a liquidity crisis in the host country that causes liquidity-constrained firms to be available at fire sale valuations to unconstrained foreign buyers. The latter story is similar to Shleifer and Vishny (1992) and in particular Krugman (1998) and Aguiar and Gopinath (2004).

Stock market prices can have either a direct effect, such as when a stock market crash reduces valuations below fundamental levels, or indirect effects. In a liquidity crisis, low

valuations might be largely driven by the perceived inability of local firms to pursue domestic investment opportunities. To the extent that valuations of unlisted firms are correlated with those of listed firms, stock market valuations would then be best seen as a proxy for the valuation of domestic capital assets in general.

Although this sort of explanation for FDI is frequently cited in popular accounts, there is little rigorous evidence, and, to our knowledge, virtually no large-sample investigation that spans many countries and a broad time period. The avialable evidence includes Aguiar and Gopinath (2004), who find that cross-border M&A increased in five Asian countries during the late-1990s crisis and that foreign acquirers concentrated on liquidity-constrained firms; and Chari, Ouimet, and Tesar (2004), who find that merger announcement returns are not higher for deals involving targets in developing countries during times of crisis.

*B.      Cheap financial capital*

In the "cheap financial capital" channel, FDI represents a natural use of temporarily low-cost financial capital (again, versus the theoretical benchmark cost of capital) enjoyed by overvalued firms in the source country. To the extent that much FDI is cross-border M&A, one version of this theory of FDI is simply the Shleifer and Vishny (2003) model of mispricing-driven acquisitions in a cross-border setting. There, managers of an overvalued acquirer know that their overpricing will end eventually, but in the meantime they benefit their ongoing investors, at the expense of new ones, by purchasing less-overvalued assets with new capital. For firms overvalued due to a domestic bubble, for example, candidate investments would include overseas targets that are not overvalued as well as zero-net-present value greenfield investment.

The cheap financial capital channel can be operative even if firms do not issue new shares or buy foreign firms with overvalued equity. By its effect on perceived collateral values,

overpriced equity can also reduce the cost of debt, and thus can also stimulate cash-financed FDI. For instance, in a manner reminiscent of the balance sheet channel in Bernanke and Gertler (1995) and Bernanke, Gertler, and Gilchrist (2000), widely-used credit scoring models, such as those of Moody's KMV, use share prices as an input to assess credit risk. Overpriced shares thus can lead to an abnormally low cost of debt.

In addition, typical extensions of credit scoring models (such as KMV's Private Firm Model) estimate credit risk for private firms using stock market valuations for comparable public firms. The widespread use of such models suggests how a stock market bubble can reduce the cost of capital of nontraded firms as well. Since parent companies are often thought to implicitly guarantee affiliate's debt, as explained by Caves (1996, p. 139), mispricing in the source country can also affect the cost of capital raised in host countries by affiliates. As a consequence of these considerations and data constraints, we do not focus on financing patterns in our empirical tests of the cheap financial capital story.

A related literature presents some evidence that the cheap financial capital story is helpful in explaining investment and merger activity *within* countries. For example, stock market valuations are strong determinants of equity issuance, and both new equity and debt issues are followed by low stock returns, consistent with the timing of new issuance to price peaks that are subsequently corrected. Some research also supports the mispricing-driven acquisitions theory in US data.[4] However, to our knowledge, we are the first to outline and test a cheap financial capital theory of FDI.

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[4] Baker, Ruback, and Wurgler (2004) survey this literature. Studies connecting valuations to equity issuance include Marsh (1982), Loughran, Ritter, and Rydqvist (1994), Jung, Kim, and Stulz (1996), Pagano, Panetta, and Zingales (1998), and Graham and Harvey (2001). Loughran and Ritter (1995), Speiss and Affleck-Graves (1995), and Baker and Wurgler (2000), among others, find that equity issuers earn low subsequent stock returns, while Speiss and Affleck-Graves (1999) and Richardson and Sloan (2003) find the same for debt issuers. Henderson, Jegadeesh, and Weisbach (2004) find similar patterns in cross-border issues. Fischer and Merton (1984), Barro (1990), Morck, Shleifer, and Vishny (1990), Blanchard, Rhee, and Summers (1993), Stein (1996), Chirinko and Schaller (2001,

Finally, we note that in addition to having more evidence already on its side, there is at least one respect in which the cheap financial capital view seems more plausible than the cheap assets view. It asks a manager to identify misvaluation only in his own firm, as opposed to that of a target asset that may be located thousands of miles away.

*C.      Why multinational arbitrage?*

An important broader question is why cross-market arbitrage would be left to multinationals, as opposed to portfolio investors. While we are not suggesting that *all* arbitrage is performed by multinationals, they do have some advantages in conducting cross-market arbitrage vis-à-vis, say, hedge fund managers. For example, consider a hedge fund manager who sells short to exploit a perceived overpricing of his country's stock market. If the mispricing gets worse before it corrects, he may have to close the position at a loss due to margin requirements or agency relationships that shorten his horizon [Shleifer (2000), ch. 2 and ch. 4]. Consistent with such factors, Brunnermeier and Nagel (2004) find that US hedge funds typically chose to ride the US Internet bubble rather than trade against it. The manager of an overvalued multinational, on the other hand, is in a better position. If she raises external finance to acquire overseas assets and her firm's shares subsequently appreciate further, her shareholders are unlikely to be upset. Stein (2004) makes a similar argument.

In summary, the theories in this section are not intended to suggest that capital market arbitrage is the sole determinant of FDI, nor that multinationals are the only or even the most important cross-country arbitrageurs. However, we believe that these theories present additional

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2004), Baker, Stein, and Wurgler (2003), Polk and Sapienza (2003), and Gilchrist, Himmelberg, and Huberman (2003) study the connection between investment and stock market mispricing. Dong, Hirshleifer, Richardson, and Teoh (2003) and Rhodes-Kropf, Robinson, and Viswanathan (2004) argue that mispricing affects merger activity in US data. In contrast, Brav and Gompers (1997) and Fama (1998) challenge the abnormality of the low returns after equity issues, while Harford (2004) argues for fundamental shocks, not market timing, as driving US merger waves.

plausible explanations of FDI flows that have been neglected by most of the work since Hymer (1960).

### III.    Methodology and data

*A.    Methodology*

The empirical hypotheses of interest are that FDI is higher when the capital in the source country is cheaper (i.e., when the source country stock market is overvalued), and that FDI is higher when the assets in the host country are cheaper (i.e., when the host country stock market is undervalued). The econometric challenge is to separately identify the effect of stock market misvaluation from the effects of other influences on FDI, in particular those that are also reflected in stock market valuations. We describe our methodology in terms of identifying the effect of source country valuations, i.e. in terms of evaluating predictions of the cheap financial capital story. The analysis for host country valuations is symmetric.

Suppose that the FDI flow from source country $i$ to host country $j$ is given by

$$FDI_{ijt} = a + b\delta_{it} + c_S\phi_{it} + c_H\phi_{jt} + \varepsilon_{1ijt} \,, \tag{1}$$

where $\delta$ is the degree of overvaluation in country $i$ at time $t$ and $\phi_k$ measures fundamentals in country $k$. Fundamentals are measured by a potentially long vector of country characteristics, which might in principle include the level of human capital, legal or technological development, profitable investment opportunities, and other fundamental (i.e., non-mispricing) determinants of FDI, multiplied by a set of loadings. We are interested in whether $b$ is greater than zero.

The first approach is to run regressions using the country-level market-to-book-value ratio as a proxy for $\delta$. If book value serves as a rough measure of fundamentals, a high market-

to-book suggests that the country's stock market may be overvalued.[5] Market-to-book is inversely related to future equity returns in the cross-section of US stocks (Basu (1983), Fama and French (1992)) and international stocks (Fama and French (1998)). Also, the aggregate US market-to-book ratio is inversely related to subsequent market returns (Kothari and Shanken (1997), Pontiff and Schall (1998)). These results are consistent with the idea that extreme values of market-to-book represent, in part, misvaluations that subsequently correct. Extreme values of market-to-book are directly connected to extreme investor expectations by La Porta (1996), La Porta, Lakonishok, Shleifer, and Vishny (1997), and Frankel and Lee (1998). With such results in mind, we start with regressions of the type

$$FDI_{ijt} = \hat{a} + \hat{b}_1 \frac{M}{B}_{it} + e_{1ijt} . \tag{2}$$

Of course, a positive and significant coefficient does not prove that $b > 0$, since

$$\frac{M}{B}_{it} = d + \delta_{it} + \phi_{it} , \tag{3}$$

where the coefficients on $\delta$ and $\phi$ are normalized to be one. (To ease the exposition, we assume that there is no measurement error in $M/B$; spherical measurement error will reduce the power of our tests. We also note that $M/B$ is exchange rate invariant.) In other words, while the market-to-book ratio may be a good proxy for $\delta$, it is also a good proxy for the other omitted country characteristics that influence FDI. For example, some theories of FDI link investment to host country GDP, tax rates, and factor endowments, and these fundamentals may be correlated with the stock market. As a result, $b_1$ will be a biased estimator of $b$. Some of these effects we can control for directly in eq. (2), but some omitted variable bias will inevitably remain.

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[5]A country-level price-earnings or price-dividend ratio could also be used as a proxy for misvaluation. Scaling by book equity seems preferable since it ensures that the denominator is positive and it reduces the influence of transient fluctuations in profits or payouts.

For example, it is particularly challenging to control for the rational expectations version of the "wealth effect" in Froot and Stein (1991), further studied by Klein and Rosengren (1994), Dewenter (1995), and Klein, Peek, and Rosengren (2002). This theory focuses on information problems in financial contracting that cause external financing to be more costly than internal financing, but it maintains an assumption of globally integrated and informationally efficient capital markets. In this theory, FDI patterns are driven by cross-country differences in firms' collateralizable wealth, or financial slack. Positive shocks to relative wealth, as might result from unhedged exchange rate changes or, more interestingly, stock market fluctuations, allow firms in the relative-wealth-increasing country to escape borrowing constraints and outbid firms in the relative-wealth-decreasing country for domestic assets.

To address the generic omitted variable bias, we take two approaches. The first is to use the future returns on the source country stock market as a cleaner proxy for mispricing. The idea is that, if the stock market were overvalued at the end of 1990, we would expect lower returns in subsequent years as the mispricing is eventually corrected. Unfortunately, there is no a priori notion of the exact horizon over which to expect correction. Too short a horizon leaves open the possibility that the mispricing has not yet corrected, while too long reduces power in a short time series. We use one-year-ahead returns to match the collection period of our FDI data. This is also consistent with the results of Kothari and Shanken (1997) and Pontiff and Schall (1998), who find that aggregate market-to-book forecasts one-year-ahead returns.

Putting this in the context of eq. (1), we view returns at $t+1$ as a function of $\delta$ at time $t$,

$$R_{it+1} = e + f\delta_{it} + \varepsilon_{2it+1},\qquad(4)$$

where $f<0$, i.e. overvaluation at time $t$ leads to lower average returns in $t+1$. Here, we assume that future returns are not related to fundamentals $\phi$. In other words, we assume that countries with a

higher level of human capital, legal or technological development, or growth opportunities do not have systematically lower returns.[6] Our first approach to omitted variable bias is then to regress market-to-book on future returns and use the fitted values to explain FDI,

$$FDI_{ijt} = \hat{a} + \hat{b}_2 \frac{\hat{M}}{B}_{it} + e_{2ijt}.$$  (5)

Since the fitted values are uncorrelated with $\phi$, this gives us an unbiased estimate of $b$.

Our second solution to omitted variable bias addresses a potential shortcoming of the first: that the correlation between $\phi$ and $\varepsilon_2$ is not zero. That is, suppose investors are routinely too optimistic when underlying investment opportunities are genuinely good—the recent US Internet bubble fits this pattern. Under this story, future returns and FDI could be connected without any causality from $\delta$ to FDI.[7] To address this possibility, our second approach exploits cross-country variation in capital market openness and the omitted variable bias in eq. (2) to put a lower bound on the magnitude of $b$.

To illustrate, we start by substituting eq. (3) into eq. (1) to get a clearer view of the omitted variable bias. Without loss of generality, we can substitute for $\phi$, obtaining

$$FDI_{ijt} = (a - c_S d) + c_S \frac{M}{B}_{it} + (b - c_S)\delta_{it} + c_H \phi_{jt} + \varepsilon_{1ijt}.$$  (6)

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[6] The orthogonality conditions are that the correlations between $\delta$ and $\varepsilon_2$, and between $\phi$ and $\varepsilon_2$, are zero.

[7] Another critique of our first approach is that M/B might predict returns because it is capitalizing the "rational" discount rate for assets in that country—lower costs of capital imply higher M/B and lower required (expected future) returns. Keep in mind that our null hypothesis is efficient and integrated world capital markets. Under this null, risk premia are set on the world capital market, and variation in valuation ratios such as M/B reflect either variation in rational expectations of cash flows (and investment opportunities) or in the risk inherent in those cash flows, but not in risk premia, since they are not country-specific under the null. Put differently, while variation in a country's M/B could reflect rational variation in the cost of capital of firms traded within that country, this could, under the null, only reflect the relatively low risk of corporate assets in that country. It does not mean that those firms would have any cost advantage in purchasing overseas assets (or, indeed, domestic assets), and hence there is no reason, under the null, for such a component of M/B to explain international capital flows. In any case, note that this critique is also addressed by our second approach to omitted variable bias.

Hence in the simple regression of FDI on market-to-book in eq. (2), the independent variable is not orthogonal to the residuals. The omitted variable bias takes the form:

$$\hat{b}_1 = c_S + (b - c_S)\frac{\text{cov}\left(\frac{M}{B}_{it}, \delta_{it}\right)}{\text{var}\left(\frac{M}{B}_{it}\right)}, \tag{7}$$

where the ratio is the fraction of the market-to-book ratio that is explained by mispricing. As is intuitive, when all variation in market-to-book is due to mispricing, the coefficient is an unbiased estimate of $b$, and when mispricing is nonexistent, it is an unbiased estimate of $c_S$.

In perfectly integrated capital markets, arbitrage will reduce the absolute value of $\delta$.[8] This suggests using the degree to which the capital market is closed as an indicator of where $\delta$ might appear in the first place. Suppose that capital market closedness perfectly measures the *extent* (not the direction) of the mispricing problem, i.e. the fraction of country stock valuations not explained by fundamentals. Then we can substitute eq. (7) into eq. (2) and estimate

$$FDI_{ijt} = \hat{a} + \left(\hat{b}_3 CAC_{it} + \hat{c}_S\right) \cdot \frac{M}{B}_{it} + e_{3ijt}, \tag{8}$$

where *CAC* measures the degree to which the capital market in country $i$ is closed at $t$. $b_3$ is not a direct estimate of $b$ but of $(b - c_S)$. Thus if $b_3$ is greater than zero, we can infer that a unit change in the mispricing component of market-to-book has a greater impact on FDI than a unit change in the fundamentals component. Of course, in the estimation below, we also control for the direct effect of capital restrictions to be sure that the result is coming from the *interaction* of valuations and the proxy for limits on cross-country arbitrage.

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[8] Of course, even within a single capital market, relative mispricing can appear, as demonstrated by Cornell and Liu (2001), Mitchell, Pulvino, and Stafford (2002), Lamont and Thaler (2003), and Schill and Zhou (2001). But within a single market as well, mispricings are more common and more severe among securities where arbitrage is relatively difficult. Many examples are cited in Shleifer (2000).

To reiterate, our second approach to omitted variable bias uses the observation that, all else equal, cross-market mispricing is more likely when cross-market arbitrage is difficult, and takes the presence of capital restrictions as a natural proxy for this difficulty. The cheap financial capital hypothesis then predicts that FDI and valuations will be especially closely related when the source market is segmented. Other theories of FDI that assume efficient and integrated capital markets, including the relative wealth theory of Froot and Stein (1991), do not make this prediction. More generally, if the relationship between FDI and valuations is simply spurious, there is no reason it should strengthen in the presence of capital controls.

Finally, a fuller version of the model would suggest that the sensitivity of FDI to the component of valuations that reflects mispricing would be higher when capital controls are operative, while the sensitivity to any residual component would not. To test this finer prediction we combine the two approaches, using future returns as a cleaner proxy for $\delta$ and closed capital markets as an instrument for the existence of mispricing:

$$FDI_{ijt} = \hat{a} + \left(\hat{b}_4 CAC_{it} + \hat{c}_i\right) \cdot \frac{\hat{M}}{B_{it}} + e_{4ijt}. \tag{9}$$

As before, $b_4$ is not a direct estimate of $b$, but if it is positive, we infer that the component of market-to-book that reflects mispricing has a greater impact on FDI than the component that reflects fundamentals. Once again, this is a unique prediction of the misvaluation-driven FDI theory. Standard theories of FDI do not make predictions for $b_4$.

B.    *FDI Data*

Direct investment is distinguished from other international capital flows by the degree to which the investor owns and controls the foreign enterprise. Some brief definitions may be useful. Direct investment is typically defined as the direct or indirect ownership or control by a single domestic legal entity (the parent) of at least ten percent of the voting securities of an

incorporated foreign business enterprise or the equivalent interest in an unincorporated foreign business enterprise (the foreign affiliate). Direct investment flows are then the funds that parents provide to their affiliates net of the funds affiliates provide to their parents.

Direct investment flows are of three basic types: equity capital, intercompany debt, and reinvested earnings. Equity capital flows include payments between parents and third parties that occur when parents change their ownership interests, as well as changes in the equity capital contribution of parents to affiliates that are wholly owned. These flows therefore capture the movement of capital used for cross-border mergers and acquisitions. Intercompany debt flows occur when parents alter the level of their net outstanding loans and trade accounts with the affiliate. Reinvested earnings are the parents' claim on the current-period undistributed after-tax earnings of affiliates.[9] Direct investment positions (i.e., stocks as opposed to flows) are the parents' net financial claims on their affiliates, whether these claims take the form of equity or debt. For further details on these definitions, see Borga (2003).

Our main FDI data set is drawn from the *Survey of US Direct Investment Abroad* and the *Survey of Foreign Direct Investment in the United States*, both conducted by the US Bureau of Economic Analysis (BEA). The sample includes information on the positions and flows of FDI into and out of the US each year from 1974 to 2001.[10] These data have some attractive features. The panel of flows to and from the 19 countries for which we also have stock market data (described below) is reasonably complete, and these data have been collected on a consistent

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[9] Our reported results are for FDI inclusive of retained earnings, but removing the retained earnings component leads to identical inferences (results available on request).

[10] Because those who do not comply with their survey requests are subject to fines and imprisonment, and because companies are reassured that the "use of an individual company's data for tax, investigative, or regulatory purposes is prohibited," the BEA believes that these data are reasonably complete and accurate.

basis over time—across source countries for FDI into the US, and across hosts for FDI out of the US. Using the BEA data, we measure FDI flows as percentages of the initial FDI position:

$$FDI_{ijt} = \frac{Flow_t^{i \to j}}{Position_{t-1}^{i \to j}}, \tag{10}$$

where $i$ is the source country is and $j$ is the host.[11] Since small initial positions can lead to outliers in this measure, we truncate it at +100 percent. Note that this variable is essentially the growth in the stock of FDI.

FDI is notoriously difficult to measure; to determine robustness, we also use two other FDI data sets. One is based on mergers and acquisitions data from Securities Data Company (SDC). As noted in Nocke and Yeaple (2003) and United Nations Center for Transnational Corporations (1999), a large fraction of FDI flows are due to cross-border mergers and acquisitions. The SDC sample includes transactions in which a US firm is either the target or the acquirer and covers 1978 through 2001, although the first half of the sample appears incomplete.[12] We measure M&A-based FDI from the US to the UK, for example, as the number of acquisitions by US firms of UK firms divided by the initial number of US affiliates in the UK. The latter is taken from the BEA and is available from 1984 through 1999.

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[11] Like Caves (1989), we scale flows by initial country-specific stocks. Froot and Stein (1991) scale flows by GNP and Dewenter (1995) scales M&A flows into the US by domestic acquisition activity. Scaling by initial position renders the FDI measure more comparable across countries. This is not important in regressions where we include country fixed effects. In such regressions, we have verified that the results are essentially unchanged when we scale by GDP. In regressions containing future returns, however, such as those along the lines of eq. (5), we prefer not to use country fixed effects. We are interested in whether FDI is especially high when future returns are low. With country fixed effects, an alternative and less interesting interpretation would be that *future* FDI is low when future returns are low, since demeaned FDI is high. The scaling in Eq. (10) avoids this ambiguity as it removes, to a large extent, the impact of fixed country characteristics on the level of FDI flows.

[12] One advantage of these data is that acquirer firms are classified by their country of origin. Therefore if a firm uses a holding company outside of its home country to buy a firm in the US, we can classify this transaction as taking place between the acquirer's home country and the US. The FDI flow and position data do not trace investment back to the country of parent origin.

We also use a panel of FDI flows and positions from the OECD *International Direct Investment Statistics* database. These data include the outflows and outward position of OECD countries' FDI with respect to a broad set of host countries, not only OECD members. This sample covers 1980 through 2001. Although these data would appear to have an advantage in coverage, data for many country pairs are missing, and there are significant differences in how different countries collect and report their data. Nonetheless, results from these data may provide a useful sense of robustness when viewed alongside those from the other data sources. We measure FDI flows in these data as in eq. (10).

The FDI data are summarized in Panel A of Table 1. The BEA data contains 407 (439) observations on FDI inflows into (outflows from) the US, or an average of 21.4 (23.1) years of data for each of the 19 non-US countries for which we also have consistent stock market data. The average annual FDI flows into the US from one of these countries increases its initial position by 20.30 percent. Likewise, on average, the annual FDI flow from the US to one of these countries increases its initial position by 11.56 percent. Mean M&A activity is significantly higher for transactions involving a US acquirer, increasing their number of affiliates by 13.83 percent per year, than for transactions involving a US target, at 3.53 percent of lagged affiliates. Mean flows from OECD members amount to 17.49 percent of their initial positions.

*C.    Stock market valuations and returns*

Stock market valuations and returns are from Ken French's website. His data include yearly observations of the capitalization-weighted market-to-book-equity ratio and stock market returns, in both dollars and local currency, for 19 countries between 1975 and 2001. For details of the construction of these variables see Fama and French (1998).[13] We then merge in US

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[13] The raw data are from Morgan Stanley's *Capital International Perspectives* (MSCI). The set of firms whose data is used to construct country-level returns and profitability variables is essentially the set of firms included in Morgan

valuations and returns, taking the market-to-book of the S&P 500 from Compustat and returns on

the S&P 500 from the CRSP database. Panel B of Table 1 reports summary statistics.

*D.*      *Country characteristics and controls*

Other data come from several sources. The return on equity, weighted across publicly-traded firms by book value, is from Ken French's website. The real exchange rate is calculated using nominal exchange rates and price indices from the IMF *International Financial Statistics*. The exchange rate series are indexed with the dollar exchange rate in 1975 set to 1 in each country. GDP and GDP per capita in 1995 US dollars are from the World Bank's *World Development Indicators*. Statutory corporate income tax rates, representing the maximum marginal statutory corporate tax rates in that country-year, are from the World Tax Database maintained by the Office of Tax Policy Research at the University of Michigan. Capital account closedness is based on Brune et al. (2001). Brune et al.'s openness index equals the number of nine capital account transactions that are not significantly restricted. To form a closedness index that matches the econometric derivation, we take nine minus Brune et al.'s index, i.e. the number of capital account transactions that *are* restricted. Panel C of Table 1 reports summary statistics.

**IV.     Empirical results**

*A.*      *Valuation levels*

Table 2 starts with simple regressions, in the spirit of eq. (2), to establish the basic correlations between FDI and stock market valuations. The dependent variables are the BEA measures of FDI into and out of the US. The independent variables of interest are the source and

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Stanley's stock index for that country. These tend to be large firms, and for a typical country they cover roughly 80 percent of the domestic stock market capitalization. Depending on the country and year, the indexes are based on a minimum of a few dozen large firms to a maximum of several hundred; see Fama and French (1998), Table I. As discussed there, there is little issue of survivor bias.

host country market-to-book ratios. To the extent that market-to-book captures misvaluation, the cheap financial capital story predicts that the coefficient on the market-to-book of the source country stock market will be positive, while the cheap asset story predicts that the coefficient on the market-to-book of the host country will be negative. As discussed above, since market-to-book picks up omitted determinants of FDI, Table 2 is not a precise test of our hypotheses, just a first step. At the same time, just determining the raw effects of source and host stock market valuations will yield some new insights, since prior work on FDI has looked only at relative market valuations.

Note that the BEA data, while preferable in other respects, are not suited to testing the cheap financial capital and cheap assets stories simultaneously. For instance, in the left columns of Table 2, which study FDI into the US from 19 source countries, the source country valuations vary each country-year, but the host (the US) valuations vary only yearly, and so their effect cannot be estimated in the presence of year effects. Similarly, in the right columns, which examine FDI out of the US, host valuations vary at the observation level but source (the US) valuation effects are estimated only from the fairly short time series (27 years). Given this 'shape' of the data, we rely on FDI into the US to examine the cheap financial capital hypothesis and on FDI out of the US to test the cheap assets story.

The specifications in Table 2 are reminiscent of standard investment-$Q$ equations used to study investment within countries, except that we can separate source and host country valuations. Caves (1989) and Klein and Rosengren (1994) consider the ratio of source and host valuations, but it is important to know whether one effect dominates. We also control for a range of other determinants of FDI. Froot and Stein (1991) and Blonigen (1997) find that real exchange rates affect FDI flows into the US. We include the return on equity, as a measure of cash flow is

often included alongside Tobin's $Q$ in investment equations. Fazarri, Hubbard, and Petersen (1988) and Lamont (1997) find that investment increases in internal finance, perhaps because external finance is more costly. The relative return on equity in the source and host countries also proxies for the relative attractiveness of fundamental investment opportunities. We include the log of GDP and GDP per capita to capture country size and wealth. Desai, Foley, and Hines (2004) find that US multinationals move capital toward low tax locations, so we include corporate tax rates. Many countries impose capital account restrictions, so we include an index of restrictions. Finally, we use country and sometimes year effects, since factors like distance and other country fixed effects are motivated by models of FDI based in trade theory.

The specifications in the left panels of Table 2 exploit heterogeneity of conditions across countries investing in the US. They provide preliminary support for the cheap financial capital hypothesis. The coefficients on the source country market-to-book are reliably positive and significant, irrespective of control variables and fixed effects. The coefficients are economically large. The standard deviation of non-US market-to-book ratios is 0.97, so a one standard deviation increase in source country market-to-book leads to a six to nine percentage point increase in FDI into the US. This compares to a mean inflow of 20.30 percentage points.[14]

The right panels of Table 2 analyze FDI out of the US. Country-year level variation in host country conditions allow for a preliminary assessment of the cheap assets view. The results provide no support for this hypothesis: The coefficients on the host country market-to-book are

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[14] Prior studies of FDI flows into the US, including Froot and Stein (1991) and Blonigen (1997), find a negative coefficient on real exchange rates. We do not find a consistent effect. This appears to be due to the sample period. Froot and Stein's (1991) sample, for example, runs from 1973 to 1988. We also find a negative coefficient over this period. However, the negative correlation between FDI into the US and the real exchange rate breaks down in more recent data. In the late 1980's and early 1990's, the dollar fell but FDI inflows also declined. More recently, the dollar has strengthened and inflows reached record levels. Klein et al. (2002) also note this shift.

weakly positive, not negative. The most robust coefficient is the negative effect of host country corporate taxes, consistent with Desai et al. (2004).[15]

Table 3 reaches similar conclusions using other FDI data sets. The first two panels consider cross-border merger and acquisition transactions that involve a US firm as acquirer or target. We measure M&A into the US from a particular country as the number of US firms acquired by firms from that country. We scale this by the total number of US affiliates of firms in the source country at the start of the year. M&A activity out of the US to a particular country is the number of firms in a host country acquired by US firms, again scaled by the number of affiliates of US firms in that country at the start of the year.

In the first panel, the coefficients on the source country market-to-book ratio are positive and significant, indicating that acquisitions of US firms increase when overseas stock markets are highly valued. This is consistent with the Shleifer and Vishny (2003) theory. In the second panel, there is again no evidence that cross-border M&A is driven by low target valuations. US firms' overseas acquisition activity does appear to be strongly dependent upon US valuations; this is consistent with the cheap financial capital hypothesis, although the effect is estimated from only a fairly short time series.

The last panel of Table 3 studies a panel of bilateral FDI outflows among 20 developed countries from the OECD *International Direct Investment Statistics*. While these data are less comparable across countries and time, in principle they allow us to simultaneously consider the cheap financial capital and cheap asset hypotheses in a broad sample. The results here are

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[15] The results here and in all subsequent tables are unchanged when we control for short- or long-term government interest rates using data from the Global Financial Database (results available upon request). However, since we could obtain interest rates only for 85 to 90 percent of our sample, we do not include them in these regressions.

essentially identical to those from the US-based data sets: source country valuations have a strong and positive influence on FDI, while host valuations are unimportant.[16]

Summing up, the results thus far document an important new fact about FDI flows: there is a very strong positive link between source country stock market valuations and FDI. Indeed, the effect of source country valuations is stronger, in statistical terms, than *any* other determinant of FDI. This relationship is potentially consistent with a cheap financial capital story, and in the rest of the paper we probe it further. The other result is the lack of evidence of fire-sale FDI. However, one caveat there is the nature of our sample. Our stock market data cover 20 mostly developed countries. While these account for the majority of the world's FDI flows [Feenstra (1999)], they may not provide the most powerful sample for testing the cheap assets story. Developing countries may be more prone to the extreme fluctuations that create conditions for fire-sale FDI. The existing evidence on the cheap assets view, Agiuar and Gopinanth (2004), is based exclusively on emerging markets. So, while our results certainly cast doubt on the cheap assets story as a *general* determinant of FDI, it could still be important in some circumstances.

B.      *Fundamental and non-fundamental valuations*

We now take a closer look at the strong positive effect of source country valuations on FDI. At face value, this is consistent with the cheap financial capital hypothesis, but it is also consistent with many other explanations, since stock market valuations may pick up not only misvaluation but also many omitted "fundamental" determinants of investment. Here we use future stock returns as an instrument for the component of market-to-book that reflects mispricing, the identifying approach discussed in eqs. (4) and (5). For brevity, we focus on the

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[16] An F-test confirms that the absolute value of the two coefficients is not equal, inconsistent with the "relative wealth" hypothesis.

BEA data on FDI flows into the US, which offers the most variation in source country valuations.[17]

As discussed previously, the idea behind this approach is that mispricing *ex ante* is can be detected from the returns that correct the mispricing *ex post*. If future returns are negatively correlated with *ex ante* mispricing and otherwise uncorrelated with measurement error in market-to-book, the fitted values from the first stage serve as a purer measure of mispricing. The first stage regression of market-to-book on one-year-ahead dollar returns yields

$$\frac{\hat{M}}{B}_{it} = 1.82 - 0.72 R_{it+1}, \tag{11}$$

with 426 observations and a heteroskedasticity robust t-statistic of 5.07 on the –0.72 coefficient. The residual, and more likely fundamental, component of the market-to-book ratio is

$$\frac{\tilde{M}}{B}_{it} = \frac{M}{B}_{it} - \frac{\hat{M}}{B}_{it}. \tag{12}$$

In decomposing valuations into fundamental and non-fundamental components in this way, we assume that mispricing is completely corrected in the next year. If it takes longer, a portion of the mispricing component will remain in the residuals in eq. (12), and the decomposition will be conservative, making it harder to find support for the misvaluation theories.

Table 4 reports the second stage estimation. The results suggest that FDI flows are positively related to both the fundamental and nonfundamental components of stock market valuations. The nonfundamental coefficient in Table 4 is about 2.5 times as large as the residual M/B coefficient. (F-tests indicate that this difference is significant at the 10 percent level in the last two specifications.) Both effects remain strong when additional controls and year effects are included. Since the standard deviation of the nonfundamental component of M/B is only 21

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[17] A broader set of results is available upon request.

percent that of the residual component, a very rough estimate of overall economic significance would be that, according to this methodology, mispricing appears half (2.5 times 0.21 equals 0.52) as important as the fundamental component of source country valuations in explaining FDI flows. This strikes us as a magnitude that is both interesting and plausible.

It is worth noting that the significant coefficient on nonfundamental market-to-book indicates that FDI predicts lower returns in the source stock market. When one views the results in this way, it becomes clear that they would be difficult to explain within existing theories of FDI, rooted in rational expectations and efficient and integrated world capital markets.[18]

C.      *Limits to cross-market arbitrage*

While the future returns results are increasingly suggestive that FDI is affected by cheap financial capital, they cannot completely rule out a spurious correlation. The key identifying assumption is that future returns are uncorrelated with omitted country characteristics that influence FDI. However, this need not be the case if investors are routinely too optimistic when underlying investment opportunities are good. For example, a technology shock could simultaneously cause FDI outflows and an overvalued stock market. We can address this possibility by testing whether the effect of source country valuations is relatively more pronounced where capital account restrictions are relatively more severe. The idea is that such restrictions limit cross-market arbitrage, making extreme values of market-to-book in the presence of such restrictions more likely to reflect mispricing. Put differently, we can use capital account closedness as an instrument for the existence of mispricing, not the direction.

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[18] We have explicitly confirmed that FDI flows into the US could be used to predict source country returns (with a negative sign). A table is available on request. We have also verified that these results are not driven by the small-sample bias in return prediction regressions discussed in Nelson and Kim (1993), Kothari and Shanken (1997), and Stambaugh (1999).

Table 5 runs regressions that interact valuation ratios with an index of capital account closedness. In Tables 5 and 6, we standardize this variable to have zero mean and unit variance. The left columns show that capital account restrictions tend to increase the effect of source country market-to-book, with a significant effect in the first specification and a marginally significant effect in the second. The interaction is not significant in the third specification. (Remember that, as discussed in detail in the methodology section, this test can only detect an effect if the coefficient on the mispricing component of M/B is actually larger than the fundamental piece. Hence, an insignificant result is not a rejection of the premise.) However, based on an F-test, this specification implies that at the lowest level of the capital account restrictions index, which characterizes about 10 percent of the sample, the source country aggregate market-to-book-value ratio is no longer a significant determinant of FDI.

The effect of capital account restrictions comes through more sharply when we combine empirical strategies, using future returns to hone in on the mispricing component of market-to-book and looking at the effect of that component in the presence of capital account restrictions. The results are in the right columns of Table 5. In each specification, the coefficients on the fitted component of source country market-to-book, and on its interactions with capital account restrictions, are positive and significant. Meanwhile, the coefficients on the fundamental component of valuations are positive and significant, but the interaction terms are not. This pattern of results accords closely with predictions. It suggests that the strategy of using capital account restrictions and future returns to identify mispricing is successful, and provides fairly convincing evidence that FDI is increased by the presence of cheap financial capital.[19]

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[19] We find similar results if the capital control indicator from the IMF is used in place of the Brune et al. (2001) measure. Also, Japan's FDI to the U.S. reached very high levels prior to the decline of the Japanese stock market and the relaxation of some Japanese capital controls. While this pattern is consistent with a cheap financial capital channel, the results do not depend on having Japan in the sample; they are qualitatively similar if it is dropped.

One last robustness check involves the fact that capital account restrictions take several forms, including restrictions on FDI outflows. While we already control for restrictions directly, it may be useful to verify that the interaction results in Table 5 come about through the ability of CAC to identify mispricing and not through a mechanical (nonlinear) effect on FDI. Table 6 investigates this issue using alternative indices of capital account restrictions. We consider three alternatives. One specifically excludes all FDI restrictions (inward and outward); one includes only outward FDI restrictions; and one includes only restrictions on capital and money market securities. The results show that excluding FDI restrictions makes little difference to the interaction coefficients, compared to those in Table 5. Likewise, an index based solely on restrictions on FDI outflows has no interesting interactive effects. This confirms that restrictions on FDI outflows are not driving the effects documented earlier. Rather, much of the effect of the overall index appears to be coming through capital and money market transaction restrictions, as suggested in the last columns of Table 6. This again is consistent with the cheap financial capital hypothesis.

## V.  Conclusion

Most of the modern literature on foreign direct investment assumes that global capital markets are informationally efficient and integrated; meanwhile, evidence casting doubt on that assumption has accumulated, and a large literature on how mispricing affects corporate investment and acquisition patterns *within* the US has developed. This paper is among the first to consider whether and how mispricing affects FDI, or investment and acquisitions across borders.

We outline two types of mispricing-driven FDI. The cheap assets view emphasizes undervaluation of host country assets, while the cheap financial capital view emphasizes

overvaluation of source country firms. To test these theories, we exploit country-year variation in stock market valuations, realized returns (which contain *ex post* information about *ex ante* mispricing), and limits to cross-market arbitrage. The results indicate that FDI is strongly related to source country stock market valuations and, in particular, the component of valuations that reflects mispricing. These findings suggest the existence of a significant cheap financial capital effect and thereby add to the list of known determinants of FDI.

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**Table 1. Summary Statistics.** Means, medians, standard deviations, and extreme values for foreign direct investment, stock market valuations and returns, and country characteristics. Panel A summarizes three sources of data on foreign direct investment. $FDI_{iUSt}$ and $FDI_{USit}$ are from the Bureau of Economic Analysis and report annual FDI flows in which the US is the host or the source country, respectively. FDI flows are measured here as the gross FDI flow as a percentage of the beginning of year stock. $M\&A_{iUSt}$ and $M\&A_{iUSt}$ are from SDC and measure cross-border mergers and acquisitions activity involving US firms as targets or acquirers, respectively. M&A flows are expressed as the number of new affiliates acquired as a percentage of the number of affiliates existing at the beginning of the year. $FDI_{ijt}$ is a full panel of bilateral FDI flows among developed countries from OECD *International Direct Investment Statistics*. FDI flows are measured here as the gross FDI flow as a percentage of the beginning of year stock. Panel B shows stock market valuations and returns data. International stock market returns in dollar and local terms, $R_{it}$, and the average market-equity-to-book-equity ratio of public firms, $M/B_{it}$, are from Ken French's website and are based on data from Morgan Stanley's *Capital International Perspectives* (MSCI). We use the S&P 500 return from CRSP and the S&P 500 market-to-book ratio from Compustat to merge in US values. Panel C summarizes country characteristics and control variables for a sample of country-years that represents the intersection between the stock market data and the BEA data on FDI into the US. For non-US countries, the return on equity $ROE_i$ is from Ken French's website and based on MSCI data. US values for the S&P 500 are from Compustat. The real exchange rate is from IMF *International Financial Statistics* and is in units of foreign currency per US dollar, with the index set to 1 for 1975. GDP and GDP per capita measured in constant 1995 US dollars are from the World Bank's *World Development Indicators*. Non-US income tax rates $Tax_i$ are from the World Tax Database maintained by the Office of Tax Policy Research at the University of Michigan. US income tax rates are from the NBER. The index of capital account closedness $CAC_{it}$ is from Brune et al. (2001).

| | N | Mean | Median | SD | Min | Max |
|---|---|---|---|---|---|---|
| | | Panel A. Foreign direct investment | | | | |
| $FDI_{iUSt}$ (%) | 407 | 20.30 | 16.29 | 26.91 | -70.97 | 100.00 |
| $FDI_{USit}$ (%) | 439 | 11.56 | 9.60 | 13.94 | -33.78 | 100.00 |
| $M\&A_{iUSt}$ (%) | 286 | 3.53 | 2.66 | 3.48 | 0.00 | 20.91 |
| $M\&A_{USit}$ (%) | 286 | 13.83 | 8.28 | 17.94 | 0.00 | 100.00 |
| $FDI_{ijt}$ (%) | 2,706 | 17.49 | 12.15 | 30.25 | -100.00 | 100.00 |
| | | Panel B. Stock market valuations and returns | | | | |
| $M/B_{it}$ | 407 | 1.81 | 1.66 | 0.97 | 0.37 | 9.84 |
| $M/B_{USt}$ | 407 | 3.14 | 2.73 | 1.78 | 1.20 | 7.01 |
| $R_{it+1}$ (%, Dollar) | 388 | 15.01 | 11.81 | 29.25 | -47.07 | 135.80 |
| $R_{it+1}$ (%, Local) | 388 | 16.14 | 13.76 | 27.08 | -39.42 | 153.67 |
| $R_{USt+1}$ (%, Dollar) | 388 | 14.91 | 20.42 | 14.77 | -11.09 | 35.71 |
| | | Panel C. Country characteristics and controls | | | | |
| $ROE_{it}$ (%) | 407 | 12.08 | 11.73 | 3.94 | 3.47 | 31.75 |
| $ROE_{USt}$ (%) | 407 | 16.19 | 14.99 | 4.06 | 10.65 | 22.98 |
| $Exrate_{it}$ (1975=1) | 407 | 1.04 | 1.01 | 0.20 | 0.56 | 1.69 |
| $GDP_{it}$ ($B1990) | 407 | 803 | 297 | 1,140 | 29 | 5,680 |
| $GDP/Cap_{it}$ ($1990) | 407 | 24,890 | 23,821 | 8,330 | 10,742 | 47,064 |
| $Tax_{it}$ (%) | 407 | 34.77 | 35.00 | 10.97 | 5.43 | 56.00 |
| $CAC_{it}$ | 407 | 3.76 | 3.00 | 2.83 | 0.00 | 9.00 |

**Table 2. FDI and Stock Market Valuations.** Regressions of FDI into and out of the US on the local market-to-book ratio, the US market-to-book ratio, and controls. The FDI data are from the BEA. All variables are summarized in Table 1. The first six columns show regressions explaining FDI flows into the US. The second six columns show regressions explaining FDI flows out of the US. Heteroskedasticity robust t-statistics are in braces.

| | FDI into the US ($FDI_{iUSt}$) | | | | | | FDI out of the US ($FDI_{USit}$) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | coef | t-stat | coef | t-stat | coef | t-stat | coef | t-stat | coef | t-stat | coef | t-stat |
| $M/B_{it}$ | 6.29 | [2.98] | 9.86 | [5.63] | 8.05 | [3.99] | 0.75 | [1.32] | 0.63 | [0.61] | 0.57 | [0.33] |
| $M/B_{USt}$ | -2.31 | [-2.17] | 0.47 | [0.29] | | | 1.22 | [0.91] | 1.35 | [0.89] | | |
| $ROE_{it}$ | | | -1.17 | [-2.23] | -1.21 | [-2.20] | | | 0.62 | [3.02] | 0.31 | [1.23] |
| $ROE_{USt}$ | | | 0.95 | [2.20] | | | | | 0.08 | [0.35] | | |
| $Exrate_{it}$ | | | 0.03 | [0.33] | -0.23 | [-1.40] | | | -0.06 | [-1.58] | -0.05 | [-1.05] |
| $\log(GDP)_{it}$ | | | 5.12 | [0.15] | 14.02 | [0.39] | | | -5.82 | [-0.89] | -3.26 | [-0.46] |
| $GDP/Cap_{it}$ | | | -3.26 | [-2.47] | -3.67 | [-2.77] | | | -0.40 | [-0.89] | -0.15 | [-0.34] |
| $Tax_{it}$ | | | -0.14 | [-0.60] | -0.20 | [-0.87] | | | -0.23 | [-2.04] | -0.25 | [-2.13] |
| $CAC_{it}$ | | | -0.21 | [-0.24] | -0.97 | [-1.04] | | | -0.34 | [-1.06] | -0.63 | [-1.75] |
| Fixed effects: | | | | | | | | | | | | |
| Country | | Yes | | Yes | | Yes | | Yes | | Yes | | Yes |
| Year | | No | | No | | Yes | | No | | No | | Yes |
| N | | 407 | | 407 | | 407 | | 439 | | 439 | | 439 |
| $R^2$ | | 0.07 | | 0.15 | | 0.23 | | 0.08 | | 0.13 | | 0.17 |

**Table 3. FDI and Stock Market Valuations: Alternative Data Sources.** The first two panels show regressions of M&A activity into and out of the US on the local market-to-book ratio, the US market-to-book ratio, and controls. The M&A data are from the SDC. Panel A shows regressions explaining M&A activity into the US. Panel B shows regressions explaining M&A activity out of the US. The last panel shows regressions of FDI between 20 developed countries on the source country market-to-book ratio, the host country market-to-book ratio, and controls. The FDI data are from the OECD. The control variables are return on equity in the source and host country, and the exchange rate, log of GDP, GDP per capita, tax rates, and capital controls in the source country. All variables are summarized in Table 1. Heteroskedasticity robust t-statistics are in braces.

| | Excluding controls | | Including controls | | | |
| --- | --- | --- | --- | --- | --- | --- |
| | coef | t-stat | coef | t-stat | coef | t-stat |
| | Panel A. M&A into the US (M&A$_{iUSt}$) | | | | | |
| M/B$_{it}$ | 1.89 | [8.36] | 1.63 | [6.05] | 1.64 | [5.61] |
| M/B$_{USt}$ | 0.12 | [1.34] | -0.18 | [1.21] | | |
| | | | | | | |
| Fixed effects: | | | | | | |
| Country | | Yes | | Yes | | Yes |
| Year | | No | | No | | Yes |
| | | | | | | |
| N | | 286 | | 286 | | 286 |
| R$^2$ | | 0.74 | | 0.78 | | 0.82 |
| | Panel B. M&A out of the US (M&A$_{USjt}$) | | | | | |
| M/B$_{jt}$ | 0.59 | [0.53] | 3.42 | [0.35] | -0.70 | [-0.68] |
| M/B$_{USt}$ | 5.56 | [10.03] | 5.55 | [5.69] | | |
| | | | | | | |
| Fixed effects: | | | | | | |
| Country | | Yes | | Yes | | Yes |
| Year | | No | | No | | Yes |
| | | | | | | |
| N | | 286 | | 286 | | 286 |
| R$^2$ | | 0.69 | | 0.73 | | 0.74 |
| | Panel C. Bilateral FDI flow (FDI$_{ijt}$) | | | | | |
| M/B$_{it}$ | 4.14 | [6.73] | 6.13 | [5.76] | 4.79 | [4.04] |
| M/B$_{jt}$ | -0.40 | [-0.56] | 0.79 | [0.88] | 0.52 | [0.53] |
| | | | | | | |
| Fixed effects: | | | | | | |
| Country (*i* and *j*) | | Yes | | Yes | | Yes |
| Year | | No | | No | | Yes |
| | | | | | | |
| N | | 2,706 | | 2,706 | | 2,706 |
| R$^2$ | | 0.06 | | 0.07 | | 0.09 |

**Table 4. FDI and Stock Market Valuations: Fundamental and Non-Fundamental Components.** Regressions of FDI into the US on the source country market-to-book ratio, the US market-to-book ratio, and controls. The FDI data are from the BEA. All variables are summarized in Table 1. We decompose the source country market-to-book ratio into a non-fundamental or mispricing component (Fitted $M/B_{it}$) and a fundamental component (Residual $M/B_{it}$). The decomposition is based on a first stage regression of market-to-book on future returns: Fitted $M/B_{it}$ = $1.82 - 0.72R_{it+1}$ (N=426, t-stat=5.07). Heteroskedasticity robust t-statistics are in braces.

| | FDI into the US ($FDI_{iUSt}$) | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| | coef | t-stat | coef | t-stat | coef | t-stat |
| Fitted $M/B_{it}$ | 17.58 | [2.85] | 21.70 | [3.31] | 22.00 | [2.82] |
| Residual $M/B_{it}$ | 7.60 | [4.54] | 9.52 | [4.81] | 8.72 | [3.28] |
| $M/B_{USt}$ | -2.06 | [-2.15] | -2.80 | [-2.12] | | |
| $ROE_{it}$ | | | -0.54 | [-1.19] | -0.61 | [-1.27] |
| $ROE_{USt}$ | | | 0.81 | [1.61] | | |
| $Exrate_{it}$ | | | 0.11 | [1.54] | -0.01 | [-0.13] |
| $\log(GDP)_{it}$ | | | 0.38 | [0.22] | -0.26 | [-0.15] |
| $GDP/Cap_{it}$ | | | -0.50 | [-2.65] | -0.48 | [-2.52] |
| $Tax_{it}$ | | | -0.06 | [-0.41] | -0.06 | [-0.41] |
| $CAC_{it}$ | | | 0.55 | [1.01] | 0.17 | [0.28] |
| Fixed effects: | | | | | | |
| Year | | No | | No | | Yes |
| N | | 388 | | 388 | | 388 |
| $R^2$ | | 0.06 | | 0.10 | | 0.17 |

**Table 5. FDI and Stock Market Valuations: Closed Capital Accounts.** Regressions of FDI into the US on the source country market-to-book ratio, the US market-to-book ratio, their interactions with a capital account openness index, and controls. The FDI data are from the BEA. All variables are summarized in Table 1. We decompose the source country market-to-book ratio into a non-fundamental or mispricing component (Fitted $M/B_{it}$) and a fundamental component (Residual $M/B_{it}$). The decomposition is based on a first stage regression of market-to-book on future returns: Fitted $M/B_{it} = 1.82 - 0.72R_{it+1}$ (N=426, t-stat=5.07). Market-to-book or its components are then interacted with an index of capital account closedness from Brune et al. (2001) for the second stage regression. CAC is standardized to have zero mean and unit variance. Heteroskedasticity robust t-statistics are in braces.

| | FDI into the US ($FDI_{iUSt}$) | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | M/B | | | | | | M/B decomposition | | | | | |
| | **Coef** | **t-stat** | **coef** | **t-stat** | **coef** | **t-stat** | **coef** | **t-stat** | **coef** | **t-stat** | **coef** | **t-stat** |
| $M/B_{it}$ | 7.95 | [3.57] | 10.93 | [5.16] | 8.71 | [3.72] | | | | | | |
| $M/B_{it} \cdot CAC_{it}$ | 4.89 | [2.04] | 4.43 | [1.68] | 2.30 | [0.88] | | | | | | |
| Fitted $M/B_{it}$ | | | | | | | 13.40 | [2.00] | 18.87 | [2.65] | 17.07 | [2.04] |
| Fitted $M/B_{it} \cdot CAC_{it}$ | | | | | | | 19.37 | [3.26] | 22.49 | [3.86] | 21.51 | [3.35] |
| Residual $M/B_{it}$ | | | | | | | 8.74 | [4.88] | 10.77 | [5.05] | 9.35 | [3.37] |
| Residual $M/B_{it} \cdot CAC_{it}$ | | | | | | | 1.01 | [0.54] | 3.00 | [1.48] | 1.83 | [0.89] |
| Controls | No | | Yes | | Yes | | No | | Yes | | Yes | |
| Fixed effects: | | | | | | | | | | | | |
| Country | Yes | | Yes | | Yes | | No | | No | | No | |
| Year | No | | No | | Yes | | No | | No | | Yes | |
| N | 407 | | 407 | | 407 | | 388 | | 388 | | 388 | |
| $R^2$ | 0.08 | | 0.16 | | 0.23 | | 0.09 | | 0.13 | | 0.20 | |

**Table 6. FDI and Stock Market Valuations: Alternative Definitions of Capital Account Closedness.** Regressions of FDI into the US on the source country market-to-book ratio, the US market-to-book ratio, their interactions with a capital account openness index, and controls. The FDI data are from the BEA. All variables are summarized in Table 1. We decompose the source country market-to-book ratio into a non-fundamental or mispricing component (Fitted M/B$_{it}$) and a fundamental component (Residual M/B$_{it}$). The decomposition is based on a first stage regression of market-to-book on future returns: Fitted M/B$_{it}$ = 1.82 – 0.72R$_{it+1}$ (N=426, t-stat=5.07). Market-to-book or its components are then interacted with alternative versions of the Brune et al. (2001) measure of capital account closedness for the second stage regression. The Brune et al. measure includes restrictions on five types of activities: invisible transactions, capital and money market transactions, credit market operations, FDI, and commercial banking transactions. The first four are divided into ingoing and outgoing restrictions. We consider measures that exclude the FDI components of the index; that are based only on capital market restrictions; and that are based only on outgoing FDI restrictions. Each measure is separately standardized to have zero mean and unit variance. Heteroskedasticity robust t-statistics are in braces.

| | FDI into the US (FDI$_{iUSt}$) | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | M/B | | | | | | M/B decomposition | | | | | |
| | Excluding FDI | | Outgoing FDI closedness | | Capital market closedness | | Excluding FDI | | Outgoing FDI closedness | | Capital market closedness | |
| | Coef | t-stat | coef | t-stat | coef | t-stat | coef | t-stat | coef | t-stat | coef | t-stat |
| M/B$_{it}$ | 9.41 | [3.69] | 7.68 | [3.79] | 7.77 | [3.72] | | | | | | |
| M/B$_{it}$ · CAC$_{it}$ | 3.57 | [1.32] | 0.75 | [0.49] | 3.53 | [1.78] | | | | | | |
| Fitted M/B$_{it}$ | | | | | | | 16.03 | [1.88] | 22.20 | [2.85] | 16.61 | [2.00] |
| Fitted M/B$_{it}$ · CAC$_{it}$ | | | | | | | 22.89 | [3.52] | 1.13 | [0.21] | 25.92 | [3.20] |
| Residual M/B$_{it}$ | | | | | | | 9.60 | [3.36] | 8.08 | [2.93] | 8.38 | [3.14] |
| Residual M/B$_{it}$ · CAC$_{it}$ | | | | | | | 1.97 | [0.93] | 1.19 | [0.76] | 2.15 | [1.19] |
| Controls | | Yes | | Yes | | Yes | | Yes | | Yes | | Yes |
| Fixed effects: | | | | | | | | | | | | |
| Country | | Yes | | Yes | | Yes | | No | | No | | No |
| Year | | Yes | | Yes | | Yes | | Yes | | Yes | | Yes |
| N | | 407 | | 407 | | 407 | | 388 | | 388 | | 388 |
| R$^2$ | | 0.23 | | 0.23 | | 0.24 | | 0.21 | | 0.18 | | 0.21 |