Multinationals as Arbitrageurs:
The Effect of Stock Market Valuations on Foreign Direct Investment[*]

Malcolm Baker
Harvard Business School and NBER
Soldiers Field Road
Boston, MA 02163
mbaker@hbs.edu

C. Fritz Foley
Harvard Business School and NBER
Soldiers Field Road
Boston, MA 02163
ffoley@hbs.edu

Jeffrey Wurgler (corresponding author)
NYU Stern School of Business and NBER
44 West 4th St., Suite 9-190
New York, NY 10012
212-998-0367
jwurgler@stern.nyu.edu

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Abstract

Empirical evidence of imperfect integration across world capital markets suggests a role for cross-border arbitrage by multinationals. Consistent with multinational arbitrage as a determinant of foreign direct investment (FDI) patterns, we find that FDI flows increase sharply with source-country stock market valuations—particularly the component of valuations that is predicted to revert the next year, and particularly in the presence of capital account restrictions that limit other mechanisms of cross-country arbitrage. The results suggest the existence of a cheap financial capital channel in which FDI flows reflect, in part, the use of relatively low-cost capital available to overvalued parents in the source country.

Traditional finance theory holds that prices across world capital markets are equalized by the arbitrage trades of agile portfolio investors, including individuals, fund managers, and other institutions that do not take controlling positions in their investments. As a result, traditional theories of foreign direct investment (FDI) assume that the more slowly-moving FDI flows are not, to any important degree, a reflection of cross-border arbitrage. Instead, the FDI literature focuses on other (clearly important) effects, such as host country market size, production scale economies, shifting comparative advantages, trade and investment barriers, and tax rates.[1]

In practice, while portfolio investment flows do ensure a fairly high degree of capital market integration and efficiency, they do not ensure perfection. Even in the largest and most liquid public equity markets, the combination of limits to cross-country arbitrage and either fluctuations in risk-aversion by local investors or irrational expectations can cause cross-market mispricings (i.e., prices that differ from the theoretical ideal price that would obtain in perfectly integrated and efficient world markets). For example, Froot and Dabora (1999) study the shares of Royal Dutch, which trades mainly in the United States, and Shell Transport, which trades mainly in the United Kingdom. Royal Dutch and Shell pay dividends in a fixed 60:40 ratio. If the U.S.-U.K. capital markets were informationally efficient and perfectly integrated, the relative share price would also be fixed at this ratio, yet the observed price ratio varies from 36:40 to 66:40 over Froot and Dabora's sample period. Further, the relative price of Royal Dutch increases when the U.S. market increases relative to the U.K. market, suggesting that broad, country-level investor demand pressures affect local valuations.[2]

Such evidence suggests that there may be room, on the margin, for arbitrage activity by multinationals. In fact, multinationals have some outright advantages in conducting arbitrage relative to, for example, hedge funds. Consider a hedge fund manager who sells an overvalued

stock short. If the overpricing increases before it reverts, he may be forced to close the position at a loss due to the margin requirements or agency relationships that shorten his horizon [e.g., Shleifer (2000); and Brunnermeier and Nagel (2004)]. The manager of an overvalued multinational is in a better position. If the manager sells overvalued securities to purchase overseas assets, and the firm's shares subsequently appreciate further, the shareholders are less likely to be upset. Stein (2005) and Baker, Ruback, and Wurgler (2006) make similar arguments.

In sum, both empirical and theoretical considerations suggest that FDI flows may reflect arbitrage activity by multinationals. In this paper, we describe and test two basic types of mispricing-driven FDI. The first is a "cheap financial capital" hypothesis, in which FDI flows are an opportunistic use of the relatively low-cost financial capital available to *overvalued source* country firms. To the extent that FDI consists of cross-border mergers and acquisitions (M&A), as opposed to greenfield investment, this hypothesis can be seen as an application of Shleifer and Vishny's (2003) model of mispricing-driven acquisitions to a cross-border setting. The second is a "cheap assets" or "fire-sale" hypothesis, under which FDI flows reflect the purchase of *undervalued host* country assets. This idea is expressed often in the financial media, especially in the context of financial crises, and has been developed by Shleifer and Vishny (1992) and especially Krugman (1998) and Aguiar and Gopinath (2005).

FDI also sheds light on why corporate investment is correlated with stock prices *within* countries. Host country valuations contain relatively more information about the marginal productivity of FDI, while source country valuations are likely to be more relevant to a foreign investor's cost of capital. By contrast, standard investment-Q equations do not allow one to estimate the extent to which a positive coefficient on the stock market proxy for Q reflects the effect of the marginal product of capital or the cost of capital (i.e., the numerator or denominator

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of the theoretical marginal Q ratio). Studies in the wake of Tobin (1969) assume that capital markets are integrated and efficient and thus rule out an independent channel for the cost of capital, while more recent work revisits Keynes's (1936) hypothesis that cheap capital has a major effect of its own. Therefore, in separating the empirical effects of source- and host-country valuations on FDI, our results shed new light on both the determinants of FDI and corporate investment more broadly defined.

To test whether the cheap financial capital and cheap assets hypotheses help to explain FDI flows between countries, we study how FDI flows depend on host and source country stock market valuations. The key econometric challenge is to determine whether the correlation between FDI and stock market valuations arises from multinational arbitrage or, alternatively, from the traditional FDI determinants listed in the introductory paragraph. We start by outlining a fairly general empirical methodology that helps us identify the presence of an independent misvaluation effect. We then apply this methodology to our main sample, which merges the U.S. Bureau of Economic Analysis (BEA) data on FDI flows and the extended international stock market valuation and returns data assembled by Fama and French (1998). The BEA data cover two kinds of FDI: FDI between U.S. parents and their foreign affiliates and FDI between foreign parents and their U.S. affiliates. The merged sample spans 1974 to 2001, and it includes observations in which 19 foreign countries are either the source of FDI into the U.S. or the host of FDI out of the U.S. For robustness, we also study two other FDI datasets.

Our preliminary analysis involves simple regressions of FDI flows on source and host-country stock market valuations. FDI flows are very strongly positively related to the average market-equity-to-book-equity-value ratio of publicly traded firms in the source country, potentially consistent with the cheap financial capital hypothesis. Indeed, source country

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valuations have a stronger effect than essentially any other determinant of FDI flows that we consider. At the same time, FDI flows are unrelated to the market-to-book ratios of host countries, contrary to the fire-sale hypothesis. Because the fire-sale hypothesis does not pass this preliminary test, we focus on the cheap financial capital hypothesis for the rest of the paper.

As just mentioned, because stock market valuations capture not only mispricing but many other "traditional" determinants of FDI, the strong relationship between FDI flows and source country valuations is only a suggestive preliminary finding, not itself sufficient evidence for the cheap financial capital hypothesis. Our three most important and conclusive tests, which are derived from our econometric methodology, but are also intuitive, allow us to document an independent misvaluation effect.

First, we apply the logic that mispricings that do appear will tend to correct over time. We use ex post stock market returns to instrument for the component of source country market-to-book that reflects ex ante mispricing. We find that FDI flows are especially strongly related to this component. In other words, FDI is high prior to periods of relatively low source country returns. FDI is also high when the residual, and more permanent, component of the source country market-to-book is high. Thus, we argue that the strong empirical relationship between source country valuations and FDI flows reflects *both* traditional fundamental factors, which are captured in high valuations that are not transient, as well as overvaluation that soon reverts. A crude calculation suggests that that mispricing is about half as important as the fundamental component of source country valuations, a magnitude that strikes us as both significant and plausible.

Second, we use cross-country variation in the degree of limits on arbitrage provided by formal capital controls. These controls limit cross-market arbitrage and so, other things equal,

increase the likelihood that an extreme value of market-to-book reflects mispricing. Thus capital controls are an instrument for the existence and extent of mispricing, as opposed to the level of valuations. We find that source country valuations indeed have stronger effects on FDI in the presence of capital controls—particularly controls that inhibit other types of cross-country arbitrage, such as capital and money market transaction restrictions. This suggests that a portion of FDI is a substitute for arbitrage that would probably have been conducted by traditional portfolio flows, were they not inhibited by regulation.

Third, we combine the power of these two approaches. We find that the component of source country market-to-book plausibly associated with mispricing has its strongest effect when capital accounts are closed. This result is again closely consistent with the cheap financial capital version of multinational arbitrage, but not with any of the traditional FDI theories that posit that world capital markets are perfectly integrated and informationally efficient.

In summary, while our empirical tests do not *rule out* alternative explanations for FDI, they appear to *rule in* that a component of FDI reflects cross-market arbitrage by multinationals. In addition to suggesting a new perspective on FDI flows, the results also bear on *within*-country investment research. That is, in the U.S. financing and investment literature, the evidence that investment predicts stock returns is difficult to interpret. It could reflect opportunistic corporate arbitrage, or alternatively it could reflect investment responding to variation in the rational cost of capital. In our international setting, the distance between the use and source of funds makes this alternative explanation less plausible. Our results show that investment by German firms *in the U.S.* predicts returns *in Germany*. This pattern is hard to reconcile with a null of integrated capital markets and more consistent with corporate arbitrage across borders. Also, and perhaps most important, we are able to exploit an instrument for cross-country mispricing, namely,

capital controls. Critics of prior work on the real effects of mispricing have questioned whether circumstances exist that would give rise to mispricing. The existence of capital controls allows us to pinpoint such circumstances in a way that is difficult to do within the U.S.

The paper proceeds as follows. Section 1 describes two basic types of mispricing-based FDI and related literature. Section 2 presents the methodology and data. Section 3 contains the empirical results. Section 4 concludes.

1.   Mispricing-driven FDI: Two Hypotheses

The Siamese twins and related evidence suggests that similar capital assets sometimes trade at different prices in different markets. There are two types of arbitrage by multinationals that could be a response to such discrepancies. The first is driven by overvaluation of the buyer or the capital it raises based on temporarily inflated collateral values. The second emphasizes the undervaluation of the assets being bought. Of course, either or both types may be behind a given "relative-value" arbitrage. Thus, while we will outline these stories separately for expositional clarity, we will keep in mind the possibility that they may operate simultaneously, and that it is an empirical matter whether they are equally important or one is dominant. We return to this point in remarks below.

Another important point is that here and throughout the paper, the terms "mispricing" and "nonfundamental" are used as a shorthand to denote deviations from a theoretical, integrated, and efficient world capital market benchmark price. That is, whether the price of similar capital assets diverges across countries because of fluctuations in risk-aversion by local investors (combined with limited arbitrage) or because of irrational expectations (combined with limited arbitrage), we refer to the result as a mispricing, relative to the traditional null hypothesis of

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integrated and efficient capital markets. Fortunately, there is little need to distinguish further because for our purpose, the interpretation of FDI as an "arbitrage" mechanism is similar regardless of the cause of the "mispricing."

1.1   Cheap financial capital hypothesis

We call FDI driven by the overvaluation of the buyer the cheap financial capital channel. According to this hypothesis, FDI is an opportunistic use of the temporarily low-cost financial capital (again, relative to the theoretical world benchmark cost of capital) available to overvalued firms in the source country. To the extent that FDI reflects cross-border M&A, this hypothesis is an application of the Shleifer and Vishny (2003) model of mispricing-driven acquisitions to a cross-border setting. There, managers of an overvalued acquirer know that the overpricing will end eventually, but they can benefit ongoing investors, at the expense of new ones, by issuing new capital to buy less-overpriced assets. For firms overvalued due to a local asset price bubble, for example, candidate investments would include overseas targets that are not particularly overvalued, as well as zero-NPV greenfield investment.

There are other versions of the cheap financial capital hypothesis that require less of managers. Indeed, managers may have correlated biases, occasionally overvaluing investment opportunities in the same direction as capital market participants. Also, managers may act in their own, empire building interests, and not in the interests of existing shareholders. Our point in this paper is simply that these investments, whatever their motivation, can be facilitated with cheap financial capital. Our tests, and our results, pinpoint the tendency of the market to misprice investment, whatever its source. Put simply, agency problems alone cannot explain why FDI precedes low source country stock market returns. Outside investors must also underestimate the

extent of the overinvestment problem ex ante. Low returns coincide with the correction of these expectations.

The cheap capital channel can also operate even if we do not observe firms issuing new public equity locally and buying foreign assets. For instance, by its effect on perceived collateral values, overpriced equity also reduces the cost of debt, and thus can also stimulate cash-financed FDI. That is, in the style of Bernanke and Gertler (1995) and Bernanke, Gertler, and Gilchrist (2000), widely-used credit scoring models, such as Moody's KMV, use share prices as an input to assess credit risk, and so overpriced shares thus can lead to an abnormally low cost of debt. In addition, extensions of such models, such as KMV's Private Firm Model, estimate credit risk for private firms using market valuations of comparable public firms, suggesting how unusually high stock market valuations could reduce the cost of capital of nontraded firms as well. These sorts of considerations, as well as practical data constraints, are why we will not focus on how FDI is financed in our empirical tests.

To our knowledge, we are the first to outline and test a cheap financial capital view of FDI.[3] However, a closely related literature presents evidence that the cheap financial capital story helps to explain 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. Using U.S. data, some researchers have also found support for the mispricing-driven acquisitions theory.[4]

1.2   Cheap assets hypothesis

We refer to FDI that is the purchase of temporarily undervalued host-country assets as the cheap assets channel. Once again, to be precise, by undervalued we mean only that assets are

priced lower than the theoretical, integrated-and-efficient-world-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; from a "rational" upward shift in host-country risk aversion; or a liquidity crisis 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 (2005).

Under this hypothesis, stock market valuations 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.

To our knowledge, there has been no large-sample investigation of the cheap assets hypothesis of FDI that spans many countries and a broad time period. The available evidence includes Aguiar and Gopinath (2005), who find that cross-border M&A increased in five Asian countries during the late-1990s financial crisis and that foreign acquirers focused 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. While important contributions, these studies do not examine whether the cheap assets hypothesis is an important *general* determinant of FDI flows—after all, most FDI flows are between developed countries—or is only operational in crisis situations. Clearly, the theoretical notion that FDI is driven by undervaluation of the host-country assets is not restricted to financial crises.

1.3   Remarks

As mentioned above, the two theories of mispricing-driven FDI are not mutually exclusive, but they are distinct. It is conceivable that both effects operate simultaneously or that only one or the other effect exists. A simple example (that abstracts from some complexities of FDI) helps illustrate this. The demand for new residential construction may be driven by the cost of finance, as well as the price of vacant lots. Whether one or both is a determinant of new construction is an empirical question. A conjecture is that lower mortgage rates increase the demand for new houses, but with no migration to locations where land is undervalued. In other words, a cheap asset effect may not influence the choice of where to purchase a new home, even if a cheap financial capital effect influences the choice of whether to purchase a new home. In the same way, it is possible that the source country cost of capital increases outbound investment by multinationals, but that the particular destination is based on other considerations like strategic fit and not on price alone.

A priori, it is not obvious which hypothesis is more promising. The cheap assets story is mentioned more often by the financial press, while several academic studies claim to document cheap financial capital effects within countries. There are reasons to think that the cheap financial capital view is a priori more plausible, however. First, it asks a manager to identify misvaluation only in his own firm, as opposed to that of a target asset that may be thousands of miles away. Second, an asymmetric limit on arbitrage, such as a short-sale constraint, would tend to increase the scope for FDI as a means to exploit overvaluation relative to undervaluation, thus increasing the relative potential for cheap capital effects. In any case, despite ample theoretical motivation, neither view of FDI has received much large-sample empirical attention.

2. Methodology and Data

2.1   Methodology

The two hypotheses of interest are that FDI is higher when (1) financial capital in the source country is unusually cheap and/or when (2) assets in the host country are unusually cheap. Our proxies for "cheapness" are country-level stock market valuations and returns. We relate these proxies to FDI using the methodology below. The key econometric challenge that our methodology attempts to solve is to separately identify the effect of stock market misvaluation ("cheapness" or "richness") from the effects of other influences on FDI, in particular those that are also reflected in stock valuations. We describe our approach in terms of identifying the effect of source country valuations (i.e., in terms of evaluating the cheap finance hypothesis); the analysis of the effect of 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 FDI_{ijt} is the flow of capital between parent firms in country i and their foreign affiliates in country j, δ is the degree of overvaluation in country i at time t, and ϕ_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 want to test whether b is greater than zero.

As a preliminary test, we run regressions using the country-level market-to-book-value ratio as a proxy for δ. If book value serves as a rough measure of fundamentals, a high market-to-book is consistent with overvaluation, and a body of prior results does suggest that market-to-book includes a *component* of mispricing.[5] A country-level price-earnings or price-dividend ratio could also be used as a proxy for misvaluation, but scaling by book equity seems preferable

because it ensures that the denominator is positive and it reduces the influence of transient fluctuations in profits or payouts. Our preliminary tests therefore involve regressions like:

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

Of course, a positive and significant coefficient does not prove that $b>0$, because, as just pointed out, the market-to-book ratio includes both fundamental and mispricing components,

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

where the coefficients on δ and ϕ are normalized to be one. M/B is exchange-rate invariant, and to ease the exposition, we are assuming that there is no measurement error in M/B (spherical measurement error will reduce the power of our tests) and that there is a linear decomposition of market-to-book into fundamental and misvaluation components. The message of Equation (3) is that while the market-to-book ratio may be a good proxy for δ, it is also a good proxy for many other omitted country characteristics that influence FDI, such as 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. While we could control for some of these effects directly in Equation (2) by including additional variables, we make the conservative assumption that some omitted variable bias is likely to remain, and so we need to find a solution.

As a concrete and particularly difficult example of omitted variable bias, consider 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 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 this alternative explanation and generic omitted variable bias, we derive and execute three more pointed tests that lead to a cleaner empirical identification of mispricing-driven FDI. The first uses 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. 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 also happens to be consistent with Kothari and Shanken (1997) and Pontiff and Schall (1998), who find that aggregate market-to-book forecasts one-year-ahead returns (with a negative coefficient).

Putting this in the context of Equation (1), the first approach to addressing omitted variables bias starts by viewing returns at $t+1$ as a function of δ at time t,

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

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, ϕ. 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 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)

Because the fitted values are uncorrelated with ϕ, this test gives us an unbiased estimate of b.

Our second solution to omitted variable bias, and thus our second more pointed test of mispricing-driven FDI, addresses the possibility that the correlation between ϕ and ε_2 may not be zero. That is, suppose investors are routinely too optimistic when underlying investment opportunities are genuinely good—the recent U.S. Internet bubble seems to fit this pattern. If so, future returns and FDI could be connected without any causality from δ to FDI.[7] To address this possibility, we exploit cross-country variation in capital market openness and the omitted variable bias in Equation (2) to put a lower bound on the magnitude of b.

To illustrate this approach, we start by substituting Equation (3) into Equation (1) to get a clear view of the omitted variable bias. Without loss of generality, we can substitute for ϕ, 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)

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

$$\hat{b}_1 = c_S + (b - c_S)\frac{\text{cov}\left(\frac{M}{B}_{it}, \delta_{it}\right)}{\text{var}\left(\frac{M}{B}_{it}\right)},$$ (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; when mispricing is nonexistent, it is an unbiased estimate of c_S.

In perfectly integrated capital markets, arbitrage reduces the absolute value of δ.[8] This suggests using the degree to which the capital market is closed as an indicator of where δ 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). In other words, capital market closedness is a proxy for the covariance term in Equation (7):

$$\frac{\text{cov}\left(\frac{M}{B}_{it}, \delta_{it}\right)}{\text{var}\left(\frac{M}{B}_{it}\right)} = gCAC_{it} + \varepsilon_{3it},$$

(8)

where *CAC* measures the degree to which the capital market in country *i* is closed at *t* and ε_3 is assumed to be orthogonal to *CAC*, ϕ, and ε_1. Then, by substituting Equation (8) into Equation (7) and the result into Equation (2), we can estimate:

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

(9)

Here, b_3 is not a direct estimate of *b* but rather of $g(b - c_S)$. So 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.

To summarize, 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 finance 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) and many other theories, *do not* make this finer 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 third test for omitted variable bias combines the first two. 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. Thus we use future returns as a cleaner proxy for δ and closed capital markets as an instrument for the existence of mispricing:

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

$$(10)$$

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, the value of this approach is that it tests a unique prediction of the misvaluation-driven FDI hypotheses. Other theories of FDI do not make predictions for b_4.

2.2   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 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 10% 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 not 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 U.S. Bureau of Economic Analysis. The data include information on the positions and flows for two kinds of FDI. The first kind is FDI between U.S. parents and their foreign affiliates, and we refer to this as FDI out of the U.S. The second kind is FDI between foreign parents and their U.S. affiliates, and we refer to this as FDI into the U.S. The data span the period from 1974 to 2001 and include observations in which 19 foreign countries are either the source of FDI into the U.S. or the host of FDI out of the U.S. These series are reasonably complete, and they have been collected on a consistent basis over time—across source countries for FDI into the U.S, and across hosts for FDI out of the U.S. We measure FDI flows as percentages of the initial FDI position:

$$FDI_{ijt} = \frac{Flow_t^{i \to j}}{Position_{t-1}^{i \to j}},$$
(11)

where i is the source country is and j is the host.[10] Because small initial positions can lead to outliers in this measure, we winsorize the measure at +100%. Note that this variable is essentially the growth in the stock of FDI.

FDI accounting can be confusing, so we explain the data using an example involving U.S. flows. As mentioned above, the BEA FDI accounts are separated into FDI flows out of the U.S. (the U.S. is the source country i) and FDI flows into the U.S. (the U.S. is host country j). If Ford Motor Company has an affiliate in Japan, flows to that affiliate are positive FDI flows out

of the U.S., while flows from the Japanese affiliate back to the U.S. parent are counted as negative FDI flows out of the U.S. Similarly, if Honda has an affiliate in the U.S., flows of capital to that affiliate are positive FDI flows into the U.S., while flows from the U.S. affiliate back to the Japanese parent are negative FDI flows into the U.S. Therefore, flows out of the U.S. reflect decisions made by U.S. firms, while flows into the U.S. reflect decisions made by Japanese firms.[11] Also, what is typically reported are measures in which affiliate flows are subtracted from the parent flows. Hence, the numerator in Equation (11) can be negative.

To assess the robustness of our results, we use two other FDI data sets. One is M&A data from Securities Data Company (SDC). As noted in United Nations Center for Transnational Corporations (1999) and Nocke and Yeaple (2007), a large fraction of FDI flows are due to cross-border mergers and acquisitions. The SDC sample includes transactions in which a U.S. firm is either the target or the acquirer and covers 1978 through 2001, though the first half of the sample appears incomplete.[12] We measure M&A-based FDI from the U.S. to the U.K., for example, as the number of acquisitions by U.S. firms of U.K. firms divided by the initial number of U.S. affiliates in the U.K. The latter is taken from the BEA for 1984 through 1999.

We also use a panel of FDI flows and positions from the OECD International Direct Investment Statistics database. These data include the foreign direct investments made by multinationals based in OECD countries with respect to a broad set of host countries, not only OECD members. This sample covers 1980 through 2001. Although these data would at first seem to have an advantage in coverage, data for many country pairs are missing, and there are significant differences in how countries collect and report their data.[13] Nonetheless, results from these data may provide some useful sense of robustness. We measure FDI flows in the OECD data as in Equation (11).

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

2.3   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).[14] We merge in U.S. 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.[15]

2.4   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. Exchange rates are indexed with the U.S. dollar exchange rate in 1975 set to 1 in each country. GDP and GDP per capita in 1995 U.S. 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, Garrett, Guisinger, and Sorens (2001). Their openness index equals the number of nine capital account transactions that are not significantly restricted. To form a "closedness" index that matches our econometric derivation, we take nine minus their "openness" index, thus counting the number of capital account transactions that *are* restricted. Panel C of Table 1 reports summary statistics.

3.   Empirical Results

3.1   Valuation levels

Table 2 starts with preliminary regressions, in the spirit of Equation (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 U.S. The independent variables of interest are the source and 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.

The specifications in Table 2 are similar to the standard investment-Q equations used to study investment within countries, except that we can separate the effects of source and host country valuations, which is novel in itself. [Caves (1989) and Klein and Rosengren (1994) only consider the ratio of source and host valuations on FDI.] However, the BEA data, while preferable in other respects, are not suited to testing the cheap finance and cheap assets stories simultaneously. In the left columns of Table 2, which study FDI into the U.S. from 19 source

countries, source country valuations vary by country-year, but host (U.S.) valuations vary yearly, so their effect cannot be estimated in the presence of year effects. In the right columns, which examine FDI out of the U.S., host valuations vary by country-year but source (U.S.) valuation effects are estimated only from the fairly short time series (27 years). Given this structure of the data, we analyze FDI into the U.S. to provide preliminary tests of the cheap financial capital view, and we analyze FDI out of the U.S. to provide preliminary tests of the cheap assets view.

As discussed above, market-to-book also picks up omitted determinants of FDI, so Table 2 is not a conclusive test of our hypotheses, just a first step. In these regressions, we also try to control directly for several other FDI determinants. Froot and Stein (1991) and Blonigen (1997) find that real exchange rates affect FDI into the U.S., so we include them. Cash flow is often included alongside Tobin's Q in investment equations to control for financial slack and fundamental investment opportunities; Fazarri, Hubbard, and Petersen (1988) and Lamont (1997) find that investment increases in internal finance, perhaps because external finance is more costly. We do not have a long time series of cash flow at the country level, so we include *ROE*. Because *ROE* also includes non-cash revenues and expenses, it is probably a better proxy than cash flow for fundamentals and a worse proxy for financial slack. We include the log of GDP and GDP per capita to capture country size and wealth. Desai, Foley, and Hines (2004) find that U.S. 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, because distance and other country fixed effects are important determinants of FDI in models based in trade theory.

The left panel of Table 2 provides preliminary support for the cheap financial capital hypothesis. The effects of the source country market-to-book on FDI into the U.S. are reliably

positive and significant, irrespective of control variables and fixed effects.[16] The coefficients are economically large. The standard deviation of non-U.S. 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 U.S. This compares to a mean inflow of 20.30 percentage points.[17]

The right panel of Table 2, in contrast, does not provide preliminary support for the cheap assets view. Country-year level variation in host country conditions does not explain patterns of FDI out of the U.S.: the coefficients on the host country market-to-book are weakly positive, not negative.[18] The most robust coefficient is the negative effect of host country corporate taxes, consistent with Desai, Foley, and Hines (2004).

These results immediately shed some new light on the prior literature that includes stock market valuations as potential determinants of FDI patterns, such as the important contributions of Klein and Rosengren (1994), Dewenter (1995), and Klein, Peek, and Rosengren (2002). These authors, considering the "relative wealth" hypothesis of Froot and Stein (1991), include various proxies for the *ratio* of stock market valuations in their specifications. Our results indicate that the effect of the ratio of stock market capitalizations that these papers document is actually one-sided: high source country stock market valuations appear to spur outward FDI, while low host country valuations seem to do little to attract inward FDI.

The cheap financial capital hypothesis links capital market conditions in the source country to FDI flows. This is clearly a story about investing new capital, not just reinvesting retained earnings. So, one would expect source country valuations to affect the component of FDI flows associated with capital raised in the source country in particular. We have run regressions similar to those presented in the third column of Table 2 using the two components of FDI – retained earnings and new capital – as separate dependent variables. When the portion

of FDI into the U.S. financed by retained earnings is the dependent variable, the coefficient on the source country market-to-book ratio is -0.7, and it has a *t*-statistic of -1.24. By contrast, when the portion of FDI into the U.S. financed by sources other than retained earnings is used as the dependent variable, this coefficient is 9.60 with a *t*-statistic of 6.59. This pattern is consistent with the cheap capital hypothesis. (We continue to report results for total FDI as the dependent variable, because it is the concept of most interest in the prior literature.)

If the results on the effects of the source market-to-book ratio were identified from only cross-sectional variation, they would raise some concerns. For example, the measured effects of the source market-to-book ratio might merely reflect the effect of country-level differences in accounting conventions [Joos and Lang (1994); and Ball, Kothari, and Robin (2000)]. To address such concerns, in unreported tests we run regressions country-by-country and then average the coefficients, as in Fama and MacBeth (1973). This isolates a pure time-series effect. The results are reassuringly similar. The country fixed effects in Table 2 should also alleviate these concerns. The third column of Table 2 includes year effects as well as country effects, with not much impact on the source-country market-to-book coefficient.[19]

Table 3 uses other FDI data but reaches very similar conclusions. The first two panels consider cross-border M&A transactions that involve a U.S. firm as either host or target. In the first panel, the effects of source country market-to-book are positive and significant, indicating that acquisitions of U.S. firms increase when overseas stock markets are highly valued. This is consistent with the Shleifer and Vishny (2003) theory and the cheap financial capital view of FDI. In the second panel, however, there is again no evidence that cross-border M&A is driven by low target valuations, inconsistent with the cheap assets view. In this panel, U.S. firms' overseas acquisition activity does appear to be strongly dependent on U.S. valuations; this is

again consistent with the cheap 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 among 20 developed countries from the OECD International Direct Investment Statistics. While these data are less comparable across countries and time, and are often missing, in principle they allow us to simultaneously consider the cheap financial capital and cheap asset hypotheses in a broad sample. The results here are again remarkably similar to those from the U.S. data: source country valuations have a strong positive effect on FDI, while host valuations are unimportant.[20]

Summing up to this point, we have studied the association between country-level stock valuations on FDI flows in mostly developed countries. We document a strong 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 that we study, and to our knowledge may be the strongest effect on FDI yet documented in the literature. This relationship is consistent with a cheap finance story, so in the rest of the paper we probe it further. The other interesting result is the *lack* of evidence for a cheap assets view of FDI in our broad sample. Thus, although Agiuar and Gopinath (2005) find evidence of fire-sale FDI in emerging markets in crisis situations, the majority of the world's FDI flows are between developed countries [Feenstra (1999)], and so the cheap assets channel may not be an important *general* driver of FDI patterns.

How might one explain the asymmetry in the support for these two theories? It is difficult to pin down, but we briefly outlined some possibilities in the hypotheses development section. An intuitive explanation is that multinationals have better information about their own cost of capital than the cost of capital or misvaluations in foreign capital markets. Another possibility is

that an asymmetric limit on arbitrage, such as short-sale constraints, increases the scope for overvaluation relative to undervaluation, thus raising the potential for cheap capital effects.

3.2   Fundamental and non-fundamental valuations

We now take a closer look at the strong positive effect of source country valuations on FDI. While it is consistent with the cheap financial capital hypothesis, it is also consistent with many other explanations, because stock market valuations pick up not only misvaluation but also omitted "fundamental" determinants of investment. To explore further, we use future stock returns as an instrument for the component of market-to-book that reflects mispricing, which is the first approach to resolving omitted variable bias and is explained using equations (4) and (5). For brevity, we focus on the BEA data on FDI flows into the U.S., which offers the most variation in source country valuations.

Once again, the idea behind this approach is that mispricing ex ante 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 country level market-to-book ratios on one-year-ahead dollar returns yields:

$$\frac{\hat{M}}{B}_{it} = 1.82 - 0.72R_{it+1}, \tag{12}$$

with 426 observations, an R^2 of 0.057, and a heteroskedasticity robust *t*-statistic of 5.07 on the coefficient of –0.72. The residual, and more likely fundamental, component of the market-to-book ratio is

$$\frac{\tilde{M}}{B}_{it} = \frac{M}{B}_{it} - \frac{\hat{M}}{B}_{it}. \tag{13}$$

Table 4 reports the second-stage results. They 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% level in the last two models. Both effects remain strong when additional controls are included. However, because the standard deviation of the nonfundamental component of M/B is only 21% that of the residual component, a very rough estimate of overall economic significance would be that, according to this methodology, mispricing is about 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.[21]

As an aside, note that the significant coefficient on nonfundamental market-to-book implies that FDI predicts lower returns in the source stock market. When one views the results in this way, it is clear that they are not predicted by typical theories of FDI, rooted in rational expectations and efficient and integrated world capital markets.[22]

The approach of Table 4 has some other appealing features. We previously discussed how the inclusion of country fixed effects, among other tests, helped alleviate concerns that the results reflected fixed country differences such as, for example, accounting treatments of book values. Another possibility is that country accounting systems (or an omitted variable more generally) *change* over time in a way that generates measurement error and biases our inferences. But if this were the case, the approach of using future stock returns as an instrument for the component of market-to-book that reflects mispricing serves the dual purpose of decomposing the market-to-book effect and alleviating concerns about measurement error.[23]

Finally, although our earlier results did not show any support for the cheap assets hypothesis, we briefly return to it here. In principle, the absence of a host country book-to-market effect could mean that low valuations arising from a high cost of capital attract FDI while low valuations arising from low growth opportunities repel FDI, and so the two subcomponents are actually offsetting. Perhaps this accounts for the patterns in Tables 2 and 3. To explore this, we have conducted an analysis like that in Table 4, using data on FDI out of the U.S. instead of FDI into the U.S. and decompositions of the host market-to-book instead of the source market-to-book. In unreported results, the impacts of both components of host market-to-book are only one-third to one-fourth as large as those of the components of source market-to-book. Moreover, the predicted impact of the fitted host market-to-book, which has the larger point estimate than the residual market-to-book, is of the wrong sign for the cheap asset hypothesis: a *high* future host return (and hence low fitted value) is actually associated with *lower* FDI. These inconsistent signs and the generally much weaker results lend further support to the conclusion that host country valuations do not have much effect on FDI in our broad sample.

3.3   Limits to cross-market arbitrage

While the results in Table 4 provide further evidence consistent with FDI responding to cheap financial capital, they cannot completely rule out a spurious correlation. The identifying assumption in Table 4 is that future returns are uncorrelated with omitted country characteristics that influence FDI. However, this would not be the case if, for example, investors are routinely too optimistic when underlying investment opportunities are also fundamentally good. We can address this possibility using our second method for addressing omitted variable bias, which examines 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 use capital account closedness as an instrument for the existence of mispricing, not the direction.

Table 5 runs regressions that interact valuation ratios with an index of capital account closedness. 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 detailed in the methodology section, this test can only detect an effect if the coefficient on the mispricing piece of M/B is actually larger than the fundamental piece. Hence, an insignificant result is not a rejection of the premise.) An F-test based on this specification implies that at the lowest level of the capital account restrictions index, which characterizes about 10% of the sample, the source country aggregate market-to-book is no longer a significant determinant of FDI.

The effect of capital account restrictions comes through more sharply in a third approach to omitted variables bias, where we combine the first two approaches. We use future returns to hone in on the mispricing component of market-to-book and then look 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 coefficients on its 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 rigorous evidence that FDI is increased by the presence of cheap finance.[24]

Finally, we consider a set of robustness checks involving capital account closedness, our instrument for the existence of mispricing. Capital account restrictions take several forms. In addition to restrictions that limit the flow of *portfolio investor* capital, the index includes restrictions on FDI itself. While we already control for the direct effect of the restrictions in our regressions, it is useful to verify that the interaction results in Table 5 come about through the ability of CAC to identify the limits to portfolio investor arbitrage and the extent of mispricing and not through some mechanical interactive effect on FDI.

Table 6 addresses this concern using alternative definitions of CAC. We consider three alternative indices. One 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, versus those in Table 5. The index based solely on restrictions on FDI outflows has no interesting interactions. These results confirm that restrictions on FDI outflows do not drive the effects documented earlier through a mechanical effect. 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. These results provide further support for the validity of our identification strategies and closely match the predictions of the cheap finance hypothesis.

4.   Conclusion

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Traditional theories of foreign direct investment assume that world capital markets are informationally efficient and integrated. However, various lines of empirical evidence suggests that country-level shocks to investor optimism or risk aversion, combined with limits to arbitrage by portfolio investors, sometimes causes the same capital asset to sell for different prices in different locations. Equivalently, the risk-adjusted costs of capital sometimes differ around the world. These observations suggest that there may be a role for arbitrage by multinationals in the form of FDI.

In this paper, we discuss and empirically evaluate two basic views of mispricing-driven FDI. The cheap assets view sees FDI as the purchase of undervalued host country assets, while the cheap finance view sees FDI as an opportunistic use of the low-cost financial capital available to overvalued source country firms. To provide a large-sample test, 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 are consistent with a pervasive cheap financial capital effect on FDI but do not support the existence of a cheap assets effect. In preliminary regression tests, FDI flows are very strongly positively related to source country stock market valuations but not strongly negatively related to host country valuations. This asymmetry has at least two natural explanations. One is that multinationals may have better information about their own cost of capital than about the cost of capital or misvaluations in foreign capital markets. The other is that an asymmetric limit on arbitrage, such as a short-sale constraint, may increase the scope for FDI as a means to exploit overvaluation relative to undervaluation.

A series of further tests, guided by a fairly general econometric methodology, indicates that an important component of the source-country valuation effect likely reflects mispricing and

not omitted variables bias. FDI flows are particularly affected by the component of valuations that is likely to reflect mispricing, and especially in the presence of capital account restrictions that limit arbitrage by portfolio investors. In summary, while our tests certainly do not *rule out* alternative explanations for FDI, they appear to *rule in* the source country cost-of-capital as a new determinant of FDI.

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Table 1. Summary statistics. Means, medians, standard deviations, and extreme values for FDI, stock market valuations and returns, and country characteristics. Panel A summarizes data on FDI from three sources. FDI_{iUSt} and FDI_{USit} are from the Bureau of Economic Analysis and report annual FDI flows in which the U.S. is the host or the source country, respectively. FDI flows are measured here as the 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 M&A activity involving U.S. 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. FDI flows are winsorized at 100%. 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 U.S. 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 U.S. For non-U.S. countries, the return on equity ROE_i is from Ken French's website and based on MSCI data. U.S. 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 U.S. dollar, with the index set to 1 for 1975. GDP and GDP per capita measured in constant 1995 U.S. dollars are from the World Bank's *World Development Indicators*. Non-U.S. income tax rates Tax_i are from the World Tax Database maintained by the Office of Tax Policy Research at the University of Michigan. The index of capital account closedness CAC_{it} is from Brune, Garrett. Guisinger, and Sorens (2001).

Table 1

	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 U.S. on the source country market-to-book ratio, the host 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 U.S. The second six columns show regressions explaining FDI flows out of the U.S. Heteroskedasticity robust t-statistics use standard errors that are clustered by year and are shown in braces.

	FDI into the U.S. (FDI_{iUSt})						FDI out of the U.S. (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	[2.51]	9.86	[4.71]	8.05	[3.48]	1.22	[1.18]	1.35	[1.46]	0.57	[0.52]
M/B_{USt}	-2.31	[-2.78]	0.47	[0.26]			0.75	[1.71]	0.63	[0.89]		
ROE_{it}			-1.17	[-2.68]	-1.21	[-2.51]			0.62	[3.14]	0.31	[1.42]
ROE_{USt}			0.95	[1.76]					0.08	[0.43]		
$Exrate_{it}$			0.03	[0.33]	-0.23	[-1.55]			-0.06	[-2.20]	-0.05	[-1.00]
$log(GDP)_{it}$			5.12	[0.12]	14.02	[0.29]			-5.82	[-0.98]	-3.26	[-0.51]
GDP/Cap_{it}			-3.26	[-2.13]	-3.67	[-2.16]			-0.40	[-0.93]	-0.15	[-0.31]
Tax_{it}			-0.14	[-0.56]	-0.20	[-0.91]			-0.23	[-2.81]	-0.25	[-2.98]
CAC_{it}			-0.59	[-0.20]	-2.76	[-0.67]			-1.02	[-1.05]	-1.85	[-1.41]
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 U.S. on the source country market-to-book ratio, the host country market-to-book ratio, and controls. The M&A data are from the SDC. Panel A shows regressions explaining M&A activity into the U.S. Panel B shows regressions explaining M&A activity out of the U.S. 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 the index of capital account closedness from Brune, Garrett, Guisinger, and Sorens (2001). All variables are summarized in Table 1. Heteroskedasticity robust *t*-statistics use standard errors that are clustered by year and are shown in braces.

Table 3

	Excluding controls		Including controls			
	coef	**t-stat**	**coef**	**t-stat**	**coef**	**t-stat**
			Panel A. M&A into the U.S. (M&A$_{iUSt}$)			
M/B$_{it}$	1.89	[9.14]	1.63	[8.18]	1.64	[7.83]
M/B$_{USt}$	0.12	[0.79]	-0.18	[-0.76]		
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 U.S. (M&A$_{USjt}$)			
M/B$_{jt}$	0.59	[0.58]	0.34	[0.30]	-0.70	[-0.52]
M/B$_{USt}$	5.56	[10.95]	5.55	[8.04]		
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	[7.50]	6.13	[4.91]	4.79	[3.45]
M/B$_{jt}$	-0.40	[-0.62]	0.79	[0.78]	0.52	[0.50]
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 U.S. on the source country market-to-book ratio, the U.S. 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, R^2=0.057). Heteroskedasticity robust t-statistics use standard errors that are clustered by year and are shown in braces.

| | FDI into the U.S. (FDI_{iUSt}) | | | | | |
	coef	t-stat	coef	t-stat	coef	t-stat
Fitted M/B_{it}	17.58	[2.58]	21.70	[3.94]	22.00	[3.62]
Residual M/B_{it}	7.61	[4.53]	9.52	[4.26]	8.72	[2.98]
M/B_{USt}	-2.07	[-2.82]	-2.80	[-1.85]		
ROE_{it}			-0.54	[-1.50]	-0.61	[-1.37]
ROE_{USt}			0.81	[0.97]		
$Exrate_{it}$			0.11	[1.58]	-0.01	[-0.14]
$\log(GDP)_{it}$			0.38	[0.19]	-0.26	[-0.13]
GDP/Cap_{it}			-0.51	[-2.33]	-0.48	[-2.09]
Tax_{it}			-0.06	[-0.41]	-0.06	[-0.40]
CAC_{it}			1.56	[0.80]	0.48	[0.20]
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 U.S. on the source country market-to-book ratio, the U.S. market-to-book ratio, the interaction of source country market-to-book 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, R^2=0.057). Source market-to-book or its components are then interacted with an index of capital account closedness from Brune, Garrett, Guisinger, and Sorens (2001) for the second-stage regression. CAC is standardized to have zero mean and unit variance. The control variables are return on equity in the source and host country, and the exchange rate, log of GDP, GDP per capita, and tax rates. Heteroskedasticity robust t-statistics use standard errors that are clustered by year and are shown in braces.

Table 5

| | FDI into the U.S. (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	[2.78]	10.93	[4.55]	8.71	[2.97]						
$M/B_{it} \cdot CAC_{it}$	4.89	[2.59]	4.43	[2.67]	2.30	[1.02]						
Fitted M/B_{it}							13.40	[1.80]	18.87	[3.73]	17.07	[2.42]
Fitted $M/B_{it} \cdot CAC_{it}$							19.37	[3.03]	22.49	[3.62]	21.51	[3.06]
Residual M/B_{it}							8.74	[5.55]	10.77	[5.45]	9.35	[3.30]
Residual $M/B_{it} \cdot CAC_{it}$							1.01	[0.53]	3.00	[1.60]	1.83	[0.97]
CAC_{it}	1.29	[0.44]	-2.20	[-0.64]	-5.83	[-1.06]	-27.33	[-2.92]	-30.89	[-3.24]	-35.41	[-3.09]
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 U.S. on source country market-to-book ratio, the U.S. market-to-book, the interaction of source country market-to-book with a capital account openness index, and controls. FDI data are from the BEA. All variables are summarized in Table 1. We decompose the source country market-to-book 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, R^2=0.057). Source market-to-book or its components are then interacted with versions of the Brune, Garrett, Guisinger, and Sorens (2001) measure of capital account closedness for the second stage. The Brune et al. measure includes restrictions on five types of transactions: invisible, capital and money market, credit market, FDI, and commercial banking. 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 and money market transactions; and that are based only on outgoing FDI restrictions. Each measure is standardized to have zero mean and unit variance. The control variables are return on equity in the source and host, the exchange rate, log GDP, GDP per capita, and tax rates. Heteroskedasticity robust t-statistics use standard errors that are clustered by year and are shown in braces.

Table 6

	FDI into the U.S. (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	[2.82]	7.68	[3.46]	7.77	[3.56]						
$M/B_{it} \cdot CAC_{it}$	3.57	[1.43]	0.75	[0.74]	3.53	[1.41]						
Fitted M/B_{it}							16.03	[2.13]	22.20	[3.62]	16.61	[2.72]
Fitted $M/B_{it} \cdot CAC_{it}$							22.89	[3.05]	1.13	[0.21]	25.92	[2.92]
Residual M/B_{it}							9.60	[3.20]	8.08	[2.55]	8.38	[3.12]
Residual $M/B_{it} \cdot CAC_{it}$							1.97	[1.04]	1.19	[0.90]	2.15	[1.09]
CAC_{it}	-6.61	[-1.20]	-4.22	[-0.95]	-7.48	[-1.41]	-37.65	[-3.16]	-1.21	[-0.12]	-43.17	[-2.95]
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

[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 (2002) survey the literature on the effect of host country tax rates on FDI. All of these models retain the assumption that capital markets are informationally efficient and integrated. 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 their theory, and related empirical studies, later in the paper.

[2] Unfortunately, the Royal Dutch and Shell experiment recently ended with the final combination of the two entities. 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 is 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.

[3] In an interesting study, Barrell and Pain (1996) use interest rates, depreciation, and exchange rates to estimate the relative user cost of capital in the U.S. and "the world" (an FDI-weighted average of estimates in Canada, Japan, Germany, France, and the U.K.) as one of several determinants of the time series of U.S. outward FDI. There are many differences between our analyses. Perhaps the most relevant is how we approach the measurement of the cost

of capital. We are interested in the hypothesis that misvaluation in the capital markets influences FDI, but they do not use stock market data and therefore do not test this proposition.

[4] Baker, Ruback, and Wurgler (2006) 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). Ritter (1991), 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 (2006) 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, 2006), Baker, Stein, and Wurgler (2003), Polk and Sapienza (2006), and Gilchrist, Himmelberg, and Huberman (2005) study the connection between investment and stock market mispricing. Dong, Hirshleifer, Richardson, and Teoh (2006) and Rhodes-Kropf, Robinson, and Viswanathan (2005) argue that mispricing affects merger activity in U.S. 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 U.S. merger waves.

[5] Market-to-book is inversely related to future equity returns in the cross-section of U.S. stocks [Basu (1983); and Fama and French (1992)] and international stocks [Fama and French (1998)], and the aggregate U.S. market-to-book ratio is inversely related to subsequent market returns [Kothari and Shanken (1997); and Pontiff and Schall (1998)]. These results are consistent with the view 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).

[6] The orthogonality conditions are that the correlations between δ and ε_2, and between ϕ and ε_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, because 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, this critique is also addressed by our second approach to omitted variable bias.

[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).

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

[10] 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 U.S. 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 Equation (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, because demeaned FDI is high. The scaling in Equation (11) avoids this ambiguity as it removes, to a large extent, the impact of fixed country characteristics on the level of FDI flows.

[11] Conceivably, one might also think of studying, for example, FDI inflows into the U.S. *net* of FDI outflows from the U.S. The problem with this approach is that one cannot separately identify the effect of source- and host-country valuations. In examining this sort of net flows, the source and host country effects are mechanically equal and opposite, i.e., the net FDI flow between countries X and Y would appear in the data both as a positive flow between host country X and source country Y and as a negative flow between host country Y and source country X.

[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 U.S., we can classify this transaction as taking

place between the acquirer's home country and the U.S. The FDI flow and position data do not trace investment back to the country of parent origin.

[13] Although U.S. data conform closely to international guidelines set by several international organizations, data from many other countries, including a large number of OECD countries, do not. See Mataloni (1995) for further discussion of the shortcomings of data collected by countries other than the U.S.

[14] 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 Stanley's stock index for that country. These tend to be large firms, and for a typical country they cover roughly 80% 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.

[15] Note that our country-level returns and valuations include both multinationals and purely domestic firms. At least in the case of source-country effects, it would be desirable to have measures of valuations and returns that pertain solely to multinationals. Unfortunately, we are not aware of data that would allow us to back out such measures for non-U.S. countries. However, assuming that multinationals are as prevalent in other countries as they are in the U.S., aggregate measures will be reasonable. The geographic segment breakdown in the U.S. Compustat data suggests that multinationals do comprise a large fraction of total market capitalizations. In 2000, 311 of the S&P 500 firms that go into computing U.S. market-to-book and returns in our data report geographic segments outside of the U.S. This subsample represents 69% of S&P 500 capitalization. In any case, an inability to perfectly isolate multinationals' valuations and returns would tend to bias results against finding source-country effects.

[16] The inclusion of the source country market-to-book ratio raises the R^2 of these specifications from 0.04 to 0.07 in the first pair of columns; from 0.10 to 0.15 in the second; and from 0.20 to 0.23 in the third. These are larger incremental increases in explanatory power than those of any other single variable we consider.

[17] The effects on the control variables are worth noting. First, source country ROE is negative and significant in explaining FDI flows into the U.S., perhaps surprising given the literature indicating a positive relationship between internally generated cash and investment. This coefficient is not very robust, however; it is smaller and statstically weak in Tables 3 and 4. It is also possible that the low accounting returns in the source country indicate low investment opportunities there. If this were the case, then firms would be inclined to invest abroad. Second, prior

studies of FDI flows into the U.S., 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 U.S. 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, Peek, and Rosengren (2002) also note this shift.

[18] The effect of U.S. valuations on FDI outflows is marginally significant in the absence of control variables and insignificant when other controls are added. This may partly reflect the fact that source country (U.S.) valuations vary only by year, not country-year; our procedure for estimating standard errors allows for clustering by country; and, more fundamentally, the relative capital account openness of the U.S. may reduce the potential for mispricing (cheap capital) relative to the potential in other countries. The U.S. price-earnings ratio, like the U.S. market to book, is also not a robust predictor of FDI flows out of the U.S. Finally, another possible explanation for the weaker U.S. results is agency problems. In other words, managers have a tendency to overinvest, but their ability to overinvest requires a combination of both high valuations and weak governance. U.S. governance is perhaps stronger than governance in other parts of the world.

[19] It is also important to point out that the results in Table 2 do not imply that FDI into the U.S. from country X increases when valuations in other non-U.S. source countries fall; it is not "relative" valuations across non-U.S. countries that seem to matter. In another unreported exercise, we include the average annual market-to-book across source countries as an additional determinant of FDI into the U.S. If it were relative foreign valuations that determined FDI into the U.S., we would expect this variable to have a coefficient that has an equal magnitude to and opposite sign of the coefficient on source country market-to-book. However, like the coefficient on source country market-to-book, the coefficient on this variable is actually positive. Hence, FDI from country X into the U.S. seems to be determined by valuations in country X, not valuations in country X relative to other countries.

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

[21] In unreported results, we have also decomposed the effects of host- and source-country market-to-book in the OECD panel. The results are qualitatively similar to those in Table 4, in that the coefficient on the fitted source country market-to-book is as large or larger than the coefficient on the residual, and the host country effects are

negligible. The most salient difference from Table 4 is that statistical significance is weaker in the case of the fitted source-country market-to-book, with *t*-statistics of less than two. In specifications that include the full set of controls, as well as host and source country fixed effects, the coefficient on the fitted source country market-to-book is 8.79 with a *t*-statistic of 1.84. In specifications that exclude the controls or include year fixed effects, the coefficient and its *t*-statistic are slightly lower. The lack of significance may reflect the shorter time-series of data in the OECD panel or the greater measurement error related to shortcomings in how data for non-U.S. countries are collected.

[22] We have explicitly confirmed that FDI flows into the U.S. 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). Finally, in decomposing valuations into fundamental and non-fundamental components as in equations (12) and (13), we are assuming that mispricing is completely corrected in the next year. In unreported results, we have added the second- and third-year-ahead returns as determinants of the fitted value in Equation (12), i.e., allowing mispricing a longer interval to correct. There is no change in the point estimates versus those in Table 4. We prefer to report the results using only one-year-ahead returns in order to avoid the complexities of statistical inference with overlapping returns data.

[23] That is, consider the approach to measurement error described by Greene (2000) on pp. 378-380. We would like to observe the component of market-to-book that reflects mispricing without measurement issues, M, but instead we only observe it with measurement issues, M^* with $M^* = M + u$. If future returns are correlated with the component of market to book that we want to capture and uncorrelated with u, then instrumenting for M^* with future returns yields consistent estimates of the effects of source country mispricings on FDI. The identifying assumption here is that changes in country accounting systems over time are largely uncorrelated with future returns.

[24] We list further robustness exercises here. First, we find similar results if the capital control indicator from the IMF is used in place of the Brune, Garrett, Guisinger, and Sorens (2001) measure. Second, 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 highly consistent with a cheap financial capital channel, the results are qualitatively similar if Japan is dropped. Third, for theoretical reasons explained in an earlier footnote, we prefer to

omit country effects in Tables 4 and 5. Their inclusion, however, leads to very similar and often statistically stronger

results.