

Stock Market Valuation, Foreign Investment and Cross-Country Arbitrage

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ABSTRACT

This study examines the impact of stock market valuation on foreign direct and indirect investments, contingent upon a country's institutional and economic development. The present paper is built upon Baker, Foley & Wurgler (2009)'s mispricing-driven foreign investment hypotheses, where foreign direct investment flows from source countries with overvalued stock market (i.e., the cheap financial capital hypothesis) and/or to host countries with undervalued assets (i.e., the cheap assets hypothesis). The present paper differs from Baker et al. (2009) in that it relaxes their underlying assumption that the valuations of financial and real assets in a country are highly correlated and in that it explicitly investigates the impact of stock market valuation on foreign direct versus indirect investment. Empirical evidence indicates that the use of relatively low-cost capital for foreign investment is prominent among developed countries, but not among emerging markets. Regarding the cheap assets hypothesis, we find that host-country stock market valuation has no significant impact on total foreign investment inflows, but it is an important determinant of the mode of foreign investment, where investors tend to choose indirect or portfolio investment as opposed to direct investment when the stock market is perceived to be undervalued. This is especially the case in emerging economies.

Key Words: Stock Market Valuation, Foreign Direct Investment (FDI), Foreign Portfolio Investment (FPI), Cross-Country Arbitrage, Institutional Environment

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1. INTRODUCTION

The literature on the determinants of foreign investment embraces several theoretical approaches. One of the earlier approaches built its premises on Dunning's eclectic theory, arguing that the factors that are necessary and unique to the host countries are the main determinants of foreign direct investment (FDI) (Gastanaga, Nugent, & Pashamova, 1998; Loree & Guisinger, 1995). Others focus on the role of political risk in determining FDI flows (Butler & Joaquin, 1998; Henisz, 2000). More recently, inspired by the institutional theory and its implications (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998; North, 1990), scholars have begun to study the effect of institutional arrangements of a country on its ability to attract FDI (English & Moore, 2002; Globerman & Shapiro, 2003; Li & Filer, 2007). For example, Globerman & Shapiro (2003) find that countries with a better legal system and stronger protection of property rights tend to attract more FDI. Using a governance environment framework, Li & Filer (2007) indicate that foreign investors are more likely to choose indirect or foreign portfolio investment (FPI) in countries with more developed public ordering, such as the rule of law and citizens' political rights, while they tend to choose FDI in countries that rely primarily on private ordering, such as personal relationship. They argue that direct and indirect investment require different governance mechanisms for investor protection, so investors prefer direct to indirect investment in countries with weak governance environments because the former can be better protected by private means.

In addition to traditional institutional arrangements, the positive relationship between stock market development and foreign investment (FDI in particular) has also been documented. On the one hand, it is argued that FDI inflows promote institutional and regulatory reforms, which result in greater investor confidence and participation in the domestic capital market

(Errunza, 1983; Yartey, 2008). On the other hand, it is argued that a well-developed stock market provides a channel for investors to invest in all sectors with relatively low transaction costs, which plays an important role in attracting foreign investments. A well-established capital market not only attracts cross-border mergers and acquisitions (M&A), which constitute an important part of FDI, but also encourages stock market activities and portfolio investment, resulting in a higher level of total foreign investment.

Despite the growing body of research in foreign investment, almost no attention had been paid to the role of stock market valuation until a recent study by Baker, Foley & Wurgler (2009). In their study, two types of mispricing-driven FDIs are investigated: (1) the cheap financial capital hypothesis, in which FDI flows from overvalued source-country firms to countries with less-overvalued assets, and (2) the cheap assets hypothesis, where FDI inflows are driven by the purchase of “cheap” or undervalued host-country assets. Empirically, they find that FDI outflows increase significantly with home-country stock market valuations, suggesting that FDI flows reflect a “cheap financial capital channel” through which the (overvalued) parent companies in the home country can get relatively low-cost capital to invest abroad. While they find no empirical support for the cheap assets hypothesis, we should note that an underlying assumption behind their empirical investigation of the cheap assets hypothesis is that the valuation of financial assets is a good proxy for the valuation of all assets in a country, which requires that the valuations of financial and real assets in a country are highly correlated.

While Baker et al. (2009) has greatly enriched our understanding of the impact of stock market valuation on foreign investment, several questions still remain. For example, is the valuation of financial assets indeed a good proxy for the valuation of real assets in a country? Does the stock market valuation play the same role in emerging markets as it does in mature

economies? And what shapes the investor's choice of foreign investment mode between direct and indirect investments? To further explore these issues, we conducted a cross-country study to examine how stock market valuation affects foreign direct and indirect investments in countries with different levels of institutional and economic development.

2. HYPOTHESIS DEVELOPMENT

2.1 Stock Market Valuation & Foreign Investment

As Baker et al. (2009) point out, two types of cross-country arbitrage may happen when similar assets are traded at different prices in different markets. First, overvalued source-country firms may use their temporarily available low-cost financial capital to purchase assets overseas, i.e., the cheap financial capital hypothesis. This hypothesis is an international generalization of Shleifer and Vishny (2003)'s model of mispricing-driven acquisitions, where overvalued acquirers attempt to time the market by issuing new equity to buy relatively less-overpriced targets. Similarly, when there is a market-wide bubble in a country, it makes sense for these temporarily overvalued multinationals to issue new equity to buy firms or assets that are not particularly overvalued in another country. In line with the cheap financial capital hypothesis, we also expect foreign investment to flow from source countries with overvalued stock market to host countries with less-overvalued stock market, all else being equal.

The other type of cross-country arbitrage involves the purchase of temporarily undervalued host-country assets by foreign investors, i.e., the cheap assets hypothesis. This hypothesis is consistent with Aguiar & Gopinath (2005)'s finding that cross-border M&A increased in five Asian countries during the late 1990s' financial crisis due to the increased investment in relatively cheap liquidity-constrained firms. Despite its strong logical and

theoretical ground, Baker et al. (2009) finds no empirical support for this hypothesis. Note, however, that their empirical investigation on the cheap assets hypothesis rests on an underlying assumption that the valuation of financial assets is a good proxy for the valuation of real assets. Our empirical framework differs from Baker et al. (2009) in that it relaxes the assumption that the valuations of financial and real assets in a country are highly correlated and that it explicitly investigates the impact of stock market valuation on foreign direct versus indirect investment.

When the presumption of the high correlation between the valuations of financial and real assets is removed, the empirical investigation of the cheap assets hypothesis is not as straightforward. Generally speaking, the total foreign investment a country attracts can be classified into direct and indirect investments, depending on the degree of control over the investment by the investors. We typically classify a foreign investment as FDI if the investor not only invests capital into a project or entity, but also exerts substantial management or control over the project or entity. In contrast, if the foreign investor does not have any material control over the management of the project or entity in which she/he is investing in, it is considered as indirect investment or FPI (Hill, 2005; Li & Filer, 2007). Portfolio investors are usually interested in short-term capital gains rather than managing the firm, and a typical case of FPI would be acquiring a small number of shares of a relatively large, publicly-traded company.

Total foreign investment inflows will increase as FDI inflows and/or FPI inflows increase. If the valuations of financial and real assets are highly correlated, then there is no doubt that FDI and total foreign investment inflows will increase when the financial assets are undervalued. If the valuations of financial and real assets are not highly correlated, however, the negative relationship between stock market valuation and FDI inflows cannot be taken for granted. The impact of host-country stock market valuation on FDI inflows in this case depends on whether

the two foreign investment modes (i.e., FDI and FPI) are substitutes or complements. If foreign direct and indirect investments are complementary, then FDI inflows will increase as FPI inflows increase, even if the valuations of financial and real assets are uncorrelated. Baker et al. (2009)'s empirical design is valid in both above-mentioned cases.

The use of the valuation of financial assets as a proxy for the valuation of real assets is more of a concern if the two foreign investment modes are substitutes, because foreign investors may simply switch from direct investment to portfolio investment when the stock market is undervalued. This may happen without any change in the amount of total foreign investment inflows. In other words, stock market undervaluation may increase FPI inflows but reduce, rather than increase, FDI inflows if the two foreign investment modes are substitutes in nature.

Unlike Baker et al. (2009), therefore, we investigate the impact of stock market valuation on host-country foreign investment inflows in a contingency framework. On the one hand, if the valuations of financial and real assets are highly correlated and/or if the two foreign investment modes are complementary, then an undervalued stock market will lead to an increase in both FPI and FDI inflows, and hence, an increase in total foreign investment inflows. On the other hand, if the valuations of financial and real assets are not highly correlated and if the two foreign investment modes are substitutes in nature, then an undervalued stock market will lead to an increase in FPI inflows and a decrease in FDI inflows with no significant impact on the amount of total foreign investment inflows.

Based on the above discussions, the following hypotheses are derived:

H1: FDI flows from source countries with overvalued stock market. That is, there is a positive relationship between stock market valuation and the country's FDI outflows.

H2a: If the valuations of financial and real assets are highly correlated and/or if FDI and FPI are complements, then an undervalued stock market will result in an increase in both FPI and FDI inflows, and hence, an increase in total foreign investment inflows.

H2b: If the valuations of financial and real assets are not highly correlated and if FDI and FPI are substitutes, then an undervalued stock market will result in an increase in FPI inflows and a decrease in FDI inflows with no significant impact on total foreign investment.

2.2 The Impact of Institutional Environment

As with other international business issues, the key to understanding foreign investment and cross-country arbitrage rests on the unique institutional features of the markets involved. Both investors and firms are shaped by the broader macro environment in which they reside. As North (1990) points out, the behavior of organizations is shaped and constrained by formal (e.g., legal system) and informal (e.g., values and norms) rules in a society. In this study, we recognize that the impact of stock market valuation on foreign investment may be different across countries with different institutional and economic development.

Considering developed versus emerging economies, for instance, we argue that the impact of host-country stock market valuation on foreign investment inflows should be more significant in emerging markets. In developed markets, dozens of market institutions facilitate the smooth functioning of capital, product, and labor markets. In such a well-developed capital market, the market tends to be more efficient in capitalizing relevant information, leaving little room for mispricing and potential arbitrage. The stock market misvaluation, however, tend to be more common or persistent in emerging economies where the stock markets are relatively immature. With institutional voids in light of unreliable sources of information, uncertain

regulatory environments, and weak property rights systems, there is often no foundation to sustain efficient information transparency. In addition, accurate valuation is more difficult in the absence of well-functioning accounting–auditing systems and independent financial intermediaries (e.g., financial analysts, rating agencies, and social media) to help validate the integrity of information. Therefore, we conjecture that foreign investors are more likely to seek cheap assets when investing in emerging markets.

The impact of institutional and economic development on the relationship between source-country stock market valuation and foreign investment outflows, however, is a more complex issue. On the one hand, the relationship may be more prominent among emerging markets given that mispricing is more likely to happen in underdeveloped or immature stock markets. On the other hand, the impact of stock market valuation on foreign investment outflows may be less significant among emerging economies because, first, emerging countries generally have a very low level of foreign investment outflows and, second, managers in emerging markets may not be sophisticated enough to successfully time the market. While it is not clear how institutional environment may affect the relationship between stock market valuation and foreign investment outflows, the impact of stock market valuation on foreign investment should be predictably different in emerging and developed economies.

The above discussions underpin the following hypothesis:

H3. The relationship between stock market valuation and foreign investment is contingent upon the stage of a country's institutional and economic development.

3. DATA AND METHODOLOGY

3.1 Data Description

The empirical investigation of this study is based on a cross-country study over an eleven-year period from 2002 to 2012. Our economic data is compiled from the World Bank's World Development Indicators (WDI) and the Worldwide Governance Indicators (WGI). The sample period begins in 2002 because in that year the World Bank started to update the WGI annually. Our financial market related data is compiled from Bloomberg and FactSet, two major multinational financial databases that provide financial information and analytic software for investment professionals.

In this study, a balanced panel sample is utilized to avoid potential survivorship bias and omitted-variable problems. After eliminating countries with insufficient reporting histories and countries with missing data in any of the above-mentioned databases, we are left with 45 countries (495 country-year observations). To understand the role of institutional environment in shaping foreign investment and cross-country arbitrage, we further classify the sample countries into two categories: developed (28 countries) and emerging economies (17 countries). Our classification of developed versus emerging markets is based on the International Monetary Fund (IMF) classification. Table 1 provides the list of sample countries, their GDP per capita figures (2012) and their governance environment scores (2012), where the governance environment scores are calculated by aggregating the WGI governance scores across the six individual dimensions, i.e., voice and accountability, political stability and lack of violence, government effectiveness, regulatory quality, rule of law, and control of corruption. Because the estimate of governance ranges from -2.5 (weak) to 2.5 (strong) for each individual dimension, our governance index ranges from -15 (weak) to 15 (strong). As Table 1 indicates, emerging

markets generally have much lower GDP per capita figures and much lower governance scores as compared to developed countries. Table 1 provides strong support for classifying countries into developed versus emerging markets.

[Insert Table 1 about here]

Table 2 presents summary statistics of the sample. The variables are defined as follows: *FI_GDP* is the total foreign investment inflows to GDP ratio; *FDI_FI* is the FDI inflows to total foreign investment inflows ratio; *FPI_FI* is the FPI inflows to total foreign investment inflows ratio; *FDI_OUT* is the FDI outflows in a country as a percentage of GDP; *MTB* is the aggregate market-to-book (M/B) ratio of listed companies in a country; *GDPG* is the annual GDP growth rate; *GDPPC* is the natural log of GDP per capita figures; *INT* is the annual real interest rate; *EX* is the exchange rate, measured as local currency per US dollar; *TAX* is the tax rate, calculated as the sum of a country's income and capital gains taxes, divided by its total revenue; *SMC* is stock market capitalization, measured as the total market capitalization of listed companies in a country as a percentage of GDP; *ROE* is the aggregate return on equity ratio in a country; *GOV* is the governance environment index, measured by aggregated WGI governance scores; *OPEN* is current account openness, calculated as the amount of exports and imports of goods and services in a country as a percentage of GDP.

[Insert Table 2 about here]

Columns 2 and 3 of Table 2 provide a close comparison between emerging and developed markets. As can be seen, compared to developed countries, emerging markets tend to receive less total foreign investment (3.4% of GDP, on average, relative to 20.2% of GDP for developed countries) and have much less FDI outflows (1.4% of GDP, on average, relative to 21.3% of GDP for developed countries). As anticipated, the aggregate market-to-book ratio is much higher among emerging markets than among developed countries (2.40 relative to 1.84). If book value serves as a rough measure of the firm's fundamentals, then a higher M/B ratio would imply that the stocks are relatively expensive or overvalued. In addition, we find that the average stock market capitalization to GDP ratio is much lower among emerging markets than among developed economies (67.0% as compared to 96.6%), suggesting that emerging markets tend to have smaller or less developed stock markets. Moreover, we find that, compared to developed economies, emerging markets tend to have higher GDP growth rates (5.24% relative to 1.89%), lower logged GDP per capita figures (8.36 as compared to 10.49), higher interest rates (6.05% as opposed to 3.29%), and higher aggregate ROE ratios (15.1% relative to 11.4%). In terms of governance environment, we find that emerging markets tend to have much lower aggregate WGI scores than developed countries (-0.91 relative to 7.99), suggesting that the governance quality is significantly lower among emerging markets. In addition, we find that emerging markets tend to be less open (exports and imports together account for 33.1% of GDP, on average, as opposed to 57.2% for developed markets). The summary statistics not only provide some basic ideas about the characteristics of the data, but also provide additional support for dividing the sample into developed and emerging markets.

Table 3 presents the correlation matrix of main variables. Based on the correlation test, both foreign investment inflows and outflows tend to be positively associated with GDP per

capita, the quality of governance environment, the openness of the country, and capital market development. Note that while Tables 2 and 3 provide some preliminary evidence on the relationships among key variables, such an analysis must be viewed cautiously given that other cross-sectional factors are not taken into consideration.

[Insert Table 3 about here]

3.2 Multivariate Regressions

For a more rigorous analysis, multivariate regressions are conducted in this section. Model (1) investigates the impact of source-country stock market valuation on FDI outflows (hypothesis *H1*). The dependent variable in the regression is the FDI outflows to GDP ratio, *FDI_OUT*. The key independent variable in the model is the aggregate market-to-book ratio, *MTB*. The control variables include the annual GDP growth rate, *GDPG*, the natural log of GDP per capita, *GDPPC*, real interest rate, *INT*, exchange rate, *EX*, tax rate, *TAX*, aggregate return on equity ratio, *ROE*, and the current account openness, *OPEN*. The control variables are chosen based on Baker et al. (2009). The only exception is that, instead of using the capital account closeness index from Brune et al. (2001), we use the current account openness to proxy for the degree to which the country is segmented. This is because Brune et al. (2001)'s capital account closeness index is not available for recent years. Specifically, the following model is estimated:

$$FDI_OUT = \lambda_0 + \lambda_1 MTB + \lambda_2 GDPG + \lambda_3 GDPPC + \lambda_4 INT + \lambda_5 EX + \lambda_6 TAX + \lambda_7 ROE + \lambda_8 OPEN + \varepsilon \quad (1)$$

Models (2) – (4) investigate the impact of host-country stock market valuation on the amount and the mode of foreign investment inflows (hypothesis *H2*). The dependent variables in the models are the total foreign investment inflows to GDP ratio, *FI_GDP*, the FDI to total

foreign investment inflows ratio, FDI_FI , and the FPI to total foreign investment inflows ratio, FPI_FI , respectively. Note that since we have constructed the total foreign investment measure as the sum of FDI and FPI, a smaller percentage of FDI means a larger percentage of FPI. Same with model (1), the key independent variable in the models is the aggregate market-to-book ratio, MTB . The control variables include the annual GDP growth rate, $GDPG$, the natural log of GDP per capita, $GDPPC$, real interest rate, INT , exchange rate, EX , tax rate, TAX , aggregate return on equity ratio, ROE , and current account openness, $OPEN$. Here, the aggregate ROE ratio is used as a firm performance measure to control for the relative attractiveness of investment opportunities. In addition to the control variables used in model (1), the stock market capitalization, SMC , is added to the models to control for the stock market development. This is because stock market development is widely documented to have a significant impact on host countries' ability to attract foreign investment (e.g., Errunza, 1983; Yartey, 2008).¹ In particular, the following models are estimated:

$$FI_GDP = \lambda_0 + \lambda_1 MTB + \lambda_2 GDPG + \lambda_3 GDPPC + \lambda_4 INT + \lambda_5 EX + \lambda_6 TAX + \lambda_7 ROE + \lambda_8 OPEN + \lambda_9 SMC + \varepsilon \quad (2)$$

$$FDI_FI = \lambda_0 + \lambda_1 MTB + \lambda_2 GDPG + \lambda_3 GDPPC + \lambda_4 INT + \lambda_5 EX + \lambda_6 TAX + \lambda_7 ROE + \lambda_8 OPEN + \lambda_9 SMC + \varepsilon \quad (3)$$

$$FPI_FI = \lambda_0 + \lambda_1 MTB + \lambda_2 GDPG + \lambda_3 GDPPC + \lambda_4 INT + \lambda_5 EX + \lambda_6 TAX + \lambda_7 ROE + \lambda_8 OPEN + \lambda_9 SMC + \varepsilon \quad (4)$$

To ensure a rigorous analysis, close attention has been paid to multicollinearity. While the correlation test in Table 3 indicates that there are a number of statistically significant relationships among explanatory variables, none of the VIF statistics is greater than 2.0, suggesting that the concern about multicollinearity among the independent variables does not appear to be warranted. Note also that panel regressions are used in all models to avoid potential

¹ For a more rigorous analysis, the regressions are also conducted with additional control variables. Such variables include the governance environment index (including voice and accountability, political stability and lack of violence, government effectiveness, regulatory quality, rule of law, and control of corruption), legal origin, host-country market size, inflation, etc. The results are unaffected.

omitted-variable problems. In addition, lagged independent variables are used in all regressions to control for potential reverse causality problems. Because observations of year 2002 are lost in calculating lagged values, our panel regressions are conducted over a 10-year period from 2003 to 2012. In order to get a more precise estimation, the error components model and generalized least squares (GLS) estimation are also applied.

4. EMPIRICAL RESULTS

4.1 Regression Results

Table 4 reports the regression results regarding the impact of stock market valuation on source-country FDI outflows, where Panel A focuses on the full sample, and Panels B and C focus on emerging and developed markets, respectively. The main finding from Table 4 is that source-country stock market valuation has a significant positive impact on FDI outflows in developed countries but not in emerging markets (hypothesis *H1* is supported in developed economies). These results can be easily explained. First, as Table 2 indicates, emerging markets generally have a very low level of foreign investment outflows with little cross-country variation. Second, managers in emerging markets may not be sophisticated enough to see through stock market misvaluation and to successfully time the market. In terms of control variables, we find that countries with higher GDP per capita and greater market openness are more likely to invest overseas, all else being equal.

[Insert Table 4 about here]

Table 5 presents the regression results regarding the impact of stock market valuation on total foreign investment inflows, where Panel A focuses on the full sample, and Panels B and C focus on emerging and developed markets, respectively. Consistent with Baker et al. (2009), we find that host-country stock market valuation has no significant impact on total foreign investment inflows. In terms of control variables, we find that GDP growth and GDP per capita play a significant role in attracting foreign investment in emerging markets, while the aggregate ROE ratio, market openness, and stock market development are more important determinants of foreign investment inflows in developed countries.

[Insert Table 5 about here]

Table 6 reports the regression results regarding the determinants of the mode of foreign investments, where Panel A focuses on FDI inflows and Panel B focuses on FPI inflows. As Table 6 indicates, the coefficient estimate on *MTB* is positive and significant in Panel A while it is negative and significant in Panel B. These results suggest that investors tend to invest in real assets (FDI) as opposed to financial assets (FPI) when the stock market is perceived to be overvalued, and they switch from FDI to FPI when the stock market is perceived to be undervalued (hypothesis *H2b* is supported). Further investigation indicates that the results are mainly driven by emerging markets. This result is predictable because the market tends to be less efficient in emerging economies, leaving more room for mispricing and potential arbitrage.

[Insert Table 6 about here]

Overall, Tables 5 and 6 suggest that the two foreign investment modes are substitutes in nature. That is, investors tend to switch from direct investment to portfolio investment when the host country stock market is perceived to be undervalued, and they choose FDI as opposed to FPI when the host-country stock market is perceived to be overvalued. This happens with no significant impact on the amount of total foreign investment inflows.

Another important finding from Tables 4-6 is that the relationship between stock market valuation and foreign investment tends to be contingent on the institutional and economic development of the countries involved. As can be seen, the impact of stock market valuation on foreign investment outflows is more significant in developed countries (Table 4), while the impact of stock market valuation on (the mode of) foreign investment inflows is more significant in emerging economies (Table 6). Therefore, hypothesis *H3* is supported.

4.2 Robustness Checks

In the literature, an inevitable challenge associated with this kind of empirical studies is endogeneity. With potential simultaneous bias, observing a significant relationship between two variables does not necessarily lead to the conclusion that A causes B. It is possible that B causes A (i.e., reverse causality), or there may be a third variable C that drives both A and B (i.e., omitted-variables bias). The following approaches are used in this study to address endogeneity: First, note that the use of panel models should largely mitigate potential omitted-variable bias, because the past values of the variables in the panel automatically capture the effects of the missing variables. Second, to control for potential reverse causality problems, lagged values are used for all independent variables in all regression models throughout this study. While our

empirical design may, to a large extent, mitigate potential endogeneity, a more rigorous approach has to be applied to gain additional confidence.

In the literature, a standard remedy for endogeneity is the use of the two-stage model or instrumental variables. Therefore, as an additional robustness check, we rerun all regressions using Baker et al. (2009)'s fitted M/B value approach. For the two-stage model to work, we need at least one instrumental variable that is highly correlated with the independent variable but uncorrelated with the dependent variable. Future returns on the stock market should serve this purpose. The idea is that, if the stock market is currently overvalued, the returns should be lower in subsequent years as the misvaluation will be corrected eventually. Empirically, previous studies find that aggregate market-to-book ratio explains a large portion of variation in 1-year-ahead returns (e.g., Kothari & Shanken, 1997; Pontiff & Schall, 1998). Therefore, we use 1-year-ahead returns as the instrumental variable in the two-stage model. Once the instrumental variable is identified, the two-stage models are then applied. In the first stage, the M/B ratio is regressed on 1-year-ahead returns and other control variables. In the second stage, the fitted M/B value is used to explain foreign investment decisions. The results are reported in Table 7. As can be seen, the results from the two-stage models are highly consistent with the findings in Tables 4-6, suggesting that endogeneity is not a serious concern in our empirical design.

[Insert Table 7 about here]

The second robustness check is related to the measure of the key independent variable, stock market valuation. Following Baker et al. (2009), we use aggregate market-to-book ratio as a proxy for stock market valuation, where a lower M/B ratio implies that the stocks are relatively

cheap or undervalued. In the literature, another frequently used price multiple is the price-to-earnings (P/E) ratio. As noted by Baker et al. (2009), the major drawbacks of using P/E ratio as a proxy for stock market valuation is the possibility of having a negative denominator and the potential influence of transient fluctuations in profits and payout policies. However, as a robustness check, we also duplicate our regressions using P/E ratio as the proxy for stock market valuation, where the results are highly consistent with the models using M/B ratio. In addition, for a more rigorous analysis, we also replicate the regressions with additional control variables. Such variables include the governance environment index, legal origin, host-country market size, inflation, etc. These additional control variables have no evident impact on the main results. These robustness checks provide strong support to our main findings.

5. CONCLUDING REMARKS

This study examines the impact of stock market valuation on foreign investment, contingent upon the stage of a country's institutional and economic development. Using balanced panel cross-country data over an eleven-year period from 2002 to 2012, we find that source-country stock market valuation has a significant positive impact on foreign investment outflows in developed countries but not in emerging markets. The insignificant result in emerging markets is most likely due to their extremely low level of foreign investment outflows and/or the inability of unsophisticated managers to successfully time the market. Regarding the cheap assets hypothesis, we find that the host-country stock market valuation has no significant impact on total foreign investment inflows. However, stock market valuation is an important determinant of the mode of foreign investment, where investors switch from direct investment to portfolio investment when the stock market is perceived to be undervalued, and they choose to

invest directly in real assets rather than financial assets if the stocks are considered to be relatively expensive. The impact is significant even after controlling for other factors and for endogeneity. These findings suggest that the two foreign investment modes are substitutes instead of complements in nature. Further investigation indicates that stock market valuation is less of a concern when the host country is a developed economy. One possible explanation is that investors believe that the stock market is relatively efficient in developed markets, leaving little room for stock misvaluation and potential arbitrage.

The present paper adds to the literature in many aspects. First, this study extends our understanding of the impact of stock market valuation on foreign investment in that it relaxes an underlying assumption made by previous studies that the valuations of financial and real assets in a country are highly correlated and in that it explicitly investigates the impact of stock market valuation on foreign direct versus indirect investment. Second, despite the long history and rich literature that has accumulated, a careful review of the foreign investment literature indicates that there are nontrivial gaps in this line of inquiry that need to be addressed. For example, what is the role of cross-country arbitrage in foreign direct and indirect investments? What is the relationship between FDI and FPI? Are they substitutes or complements? Are the relationships affected by the stage of institutional and economic development? This study effectively addresses these questions. Moreover, while foreign investment has been a subject of extensive research in the literature, there are relatively few cross-national studies that consider both foreign direct and indirect investments in an integrated framework. This study adds to the small but growing set of cross-country studies. Lastly, this study also sheds light on the institutional theory. As the empirical evidence indicates, an obvious implication arising from this study is

that the unique institutional features of the markets involved play an important role in shaping foreign investment and cross-country arbitrage.

Despite these contributions and novel findings, some caveats should be noted. First, while the empirical results in this study provide some indirect evidence that the valuations of financial and real assets are not highly correlated, we are not able to test the relationship directly due to data limitations. Therefore, a possible extension would be to examine the relationship between the valuations of financial and real assets directly using different research designs to substantiate the results of this study. Another area for future research relates to our focus on nationally aggregated data. Extensions might model and explore the impact of stock market valuation on foreign investment activities using both country-level and firm-level variables. Intensive case studies at the firm level may also offer some additional insights.

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Table 1. Sample Countries

This table presents the list of sample countries, their GDP per capita figures (2012), and their governance environment scores (2012), calculated by aggregating the WGI governance scores across the six individual dimensions (i.e., voice and accountability, political stability and lack of violence, government effectiveness, regulatory quality, rule of law, and control of corruption). Because the estimate of governance ranges from -2.5 (weak) to 2.5 (strong) for each individual dimension, our governance scores range from -15 to 15.

Emerging Markets (17)			Developed Markets (28)		
	<i>GDP Per Capita</i>	<i>WGI</i>		<i>GDP Per Capita</i>	<i>WGI</i>
Argentina	\$11,573.06	-2.10	Australia	\$67,555.76	9.62
Brazil	\$11,339.52	0.28	Austria	\$46,642.29	9.05
Chile	\$15,452.17	7.11	Belgium	\$43,372.37	8.01
China	\$6,091.01	-3.34	Canada	\$52,218.99	9.66
Colombia	\$7,747.84	-1.94	Czech Republic	\$18,682.81	5.18
India	\$1,489.23	-2.22	Denmark	\$56,325.66	10.60
Indonesia	\$3,556.79	-2.36	Finland	\$45,720.77	11.20
Malaysia	\$10,432.06	2.02	France	\$39,771.84	7.07
Mexico	\$9,748.87	-0.75	Germany	\$41,862.71	8.68
Pakistan	\$1,256.66	-7.04	Greece	\$22,082.89	1.37
Peru	\$6,795.77	-1.47	Hong Kong	\$36,795.82	8.64
Philippines	\$2,587.02	-2.31	Hungary	\$12,530.53	3.85
Poland	\$12,707.85	5.04	Ireland	\$45,931.72	8.51
Russia	\$14,037.02	-4.40	Israel	\$33,250.09	3.71
South Africa	\$7,507.67	1.19	Italy	\$33,071.84	2.87
Thailand	\$ 5,479.76	-1.63	Japan	\$46,720.36	7.48
Turkey	\$10,666.06	-0.41	Luxembourg	\$103,827.99	10.28
			Netherlands	\$45,954.73	10.32
			New Zealand	\$37,749.44	10.83
			Norway	\$99,557.73	10.68
			Portugal	\$20,165.29	5.55
			Singapore	\$51,709.45	9.46
			South Korea	\$22,590.16	4.38
			Spain	\$28,624.47	5.17
			Sweden	\$55,041.16	10.95
			Switzerland	\$78,924.73	10.57
			United Kingdom	\$39,093.47	8.23
			United States	\$51,748.56	7.53

Table 2. Summary Statistics

This table reports the summary statistics of the sample, sorted by emerging versus developed markets. The variables in the table are defined as follows: *FI_GDP* is the total foreign investment inflows to GDP ratio; *FDI_FI* is the FDI inflows to total foreign investment inflows ratio; *FPI_FI* is the FPI inflows to total foreign investment inflows ratio; *FDI_OUT* is the FDI outflows to GDP ratio; *MTB* is the aggregate market-to-book ratio of listed companies in a country; *GDPG* is the annual GDP growth rate; *GDPPC* is the natural log of GDP per capita figures; *INT* is the real interest rate; *EX* is the exchange rate (local currency per US dollar); *TAX* is the tax rate; *ROE* is the aggregate return on equity ratio; *OPEN* is current account openness; *GOV* is the governance environment index; *SMC* is the total stock market capitalization to GDP ratio. The final sample consists of 45 countries and the sample period spans from 2002 to 2012. Standard deviations are in parentheses. Here * indicates $p < 0.10$, ** indicates $p < 0.05$, *** indicates $p < 0.01$.

	<i>Full Sample</i>	<i>Emerging Markets</i>	<i>Developed Markets</i>	<i>Mean Diff. (DM-EM)</i>
# Obs.	495	187	308	
FI_GDP	0.1392 (0.64)	0.0343 (0.02)	0.2020 (0.81)	0.17***
FDI_FI	0.8682 (1.59)	0.9376 (1.13)	0.8268 (1.80)	-0.11
FPI_FI	0.1318 (1.59)	0.0624 (1.13)	0.1732 (1.80)	0.11
FDI_OUT	0.1381 (0.65)	0.0142 (0.02)	0.2126 (0.81)	0.20***
MTB	2.0550 (1.91)	2.4021 (2.97)	1.8443 (0.65)	-0.56***
GDPG	3.1259 (3.45)	5.2368 (3.13)	1.8896 (3.01)	-3.35***
GDPPC	9.6807 (1.21)	8.3577 (0.84)	10.4869 (0.47)	2.13***
INT	4.5505 (7.33)	6.0542 (10.29)	3.2875 (2.61)	-2.77***
EX	417.1683 (1628.51)	723.5639 (2213.72)	91.6231 (267.96)	-631.90***
TAX	31.0842 (12.81)	30.1102 (12.57)	31.6184 (12.94)	1.51
SMC	85.3635 (77.05)	66.9551 (51.99)	96.5801 (87.13)	29.63***
ROE	12.8060 (5.86)	15.0545 (4.39)	11.4409 (6.22)	-3.61***
GOV	4.6273 (5.13)	-0.9063 (3.19)	7.9870 (2.48)	8.89***
OPEN	48.0718 (41.74)	33.1026 (19.83)	57.1928 (48.46)	24.09***

Table 3. Correlation Matrix

This table reports the correlation coefficients of key variables. The variables in the table are defined as follows: *FI_GDP* is the total foreign investment inflows to GDP ratio; *FDI_FI* is the FDI inflows to total foreign investment inflows ratio; *FPI_FI* is the FPI inflows to total foreign investment inflows ratio; *FDI_OUT* is the FDI outflows to GDP ratio; *MTB* is the aggregate market-to-book ratio of listed companies in a country; *GDPG* is the annual GDP growth rate; *GDPPC* is the natural log of GDP per capita figures; *INT* is the real interest rate; *EX* is the exchange rate (local currency per US dollar); *TAX* is the tax rate; *ROE* is the aggregate return on equity ratio; *OPEN* is current account openness; *GOV* is the governance environment index; *SMC* is the total stock market capitalization to GDP ratio. The final sample consists of 45 countries and the sample period spans from 2002 to 2012. Here * indicates $p < 0.10$, ** indicates $p < 0.05$, *** indicates $p < 0.01$.

	FI_GDP	FDI_FI	FPI_FI	FDI_OUT	MTB	GDPG	GDPPC	INT	EX	TAX	ROE	GOV	OPEN	SMC
FI_GDP	1													
FDI_FI	-0.07	1												
FPI_FI	0.07	-1	1											
FDI_OUT	0.73***	-0.07	0.07	1										
MTB	0.04	-0.04	0.04	-0.03	1									
GDPG	0.03	-0.02	0.02	-0.04	0.21***	1								
GDPPC	0.20***	-0.04	-0.04	0.25***	-0.18***	-0.48***	1							
INT	-0.04	0.01	-0.01	-0.09	0.005	-0.02	-0.14	1						
EX	-0.09	-0.04	0.04	-0.09	0.05	0.10†	-0.28***	-0.018	1					
TAX	-0.004	0.01	-0.01	-0.02	0.08	-0.01	0.06	-0.04	-0.01	1				
ROE	-0.01	0.02	-0.02	-0.006	0.17***	0.41***	-0.30***	0.07	0.10†	0.03	1			
GOV	0.17***	-0.05	0.05	0.20***	-0.12*	-0.40***	0.89***	-0.15***	-0.27***	0.17***	-0.25***	1		
OPEN	0.38***	0.07	-0.07	0.43***	-0.06	0.05	0.28***	-0.10†	-0.10†	0.02	-0.11**	0.33***	1	
SMC	0.21***	-0.04	0.04	0.22***	0.06	0.14***	0.24***	-0.07	-0.14*	0.27***	0.05	0.31***	0.59***	1

Table 4. Determinants of FDI Outflows

This table reports the regression results regarding the determinants of FDI outflows, where Panels A, B, and C focus on the full sample, emerging markets, and developed markets, respectively. The independent variables are defined as follows: *MTB* is the aggregate market-to-book ratio of listed companies in a country, *GDPG* is the annual GDP growth rate, *GDPPC* is the natural log of GDP per capita figures, *INT* is the real interest rate, *EX* is the exchange rate (local currency per US dollar), *TAX* is the tax rate, *ROE* is the aggregate return on equity ratio, and *OPEN* is current account openness. Note that to control for potential endogeneity, lagged values are used for all independent variables in all models. The panel regression is conducted based on 45 countries over a 10-year period from 2003 to 2012. The *t*-values are in parentheses. Here * indicates $p < 0.10$, ** indicates $p < 0.05$, *** indicates $p < 0.01$.

	Panel A: Full Sample		Panel B: Emerging Markets		Panel C: Developed Markets	
	<i>Model (1)</i>	<i>Model (2)</i>	<i>Model (1)</i>	<i>Model (2)</i>	<i>Model (1)</i>	<i>Model (2)</i>
Intercept	-0.1599*** (-3.45)	-0.1638*** (-3.50)	-0.0547*** (-2.89)	-0.0539*** (-2.82)	-0.2176 (-0.91)	-0.3666 (-1.55)
MTB		0.0010 (0.64)		-0.0001 (-0.33)		0.0538*** (2.96)
GDPG	-0.0004 (-0.30)	-0.0005 (-0.37)	-0.0001 (-0.15)	-0.0001 (-0.12)	-0.0014 (-0.46)	-0.0050 (-1.61)
GDPPC	0.0153*** (3.66)	0.0156*** (3.70)	0.0089*** (4.57)	0.0088*** (4.49)	0.0180 (0.78)	0.0246 (1.10)
INT	-0.00002 (-0.03)	-0.00002 (-0.03)	-0.0002 (-1.38)	-0.0002 (-1.37)	-0.0003 (-0.09)	0.0005 (0.13)
EX	0.000001 (0.38)	0.000001 (0.39)	0.0000001 (0.25)	0.0000001 (0.25)	-0.00001 (-0.19)	0.00003 (0.87)
TAX	-0.0006* (-1.83)	-0.0006* (-1.88)	-0.0002* (-1.67)	-0.0002 (-1.62)	-0.0004 (-0.65)	-0.0004 (-0.67)
ROE	0.0024** (2.36)	0.0024** (2.34)	-0.0004 (-1.08)	-0.0004 (-1.09)	0.0044** (2.10)	0.0019 (0.87)
OPEN	0.0010*** (10.26)	0.0010*** (10.26)	0.0003*** (4.08)	0.0003*** (4.05)	0.0011*** (6.49)	0.0012*** (7.36)
Adj. R-Sq	0.4143	0.4126	0.4258	0.4205	0.3504	0.3977

Table 5. Determinants of Total Foreign Investment Inflows

This table reports the regression results regarding the determinants of total foreign investment inflows, where Panels A, B, and C focus on the full sample, emerging markets, and developed markets, respectively. The independent variables are defined as follows: *MTB* is the aggregate market-to-book ratio of listed companies in a country, *GDPG* is the annual GDP growth rate, *GDPPC* is the natural log of GDP per capita figures, *INT* is the real interest rate, *EX* is the exchange rate (local currency per US dollar), *TAX* is the tax rate, *ROE* is the aggregate return on equity ratio, *OPEN* is current account openness, and *SMC* is the total stock market capitalization to GDP ratio. Note that to control for potential endogeneity, lagged values are used for all independent variables in all models. The panel regression is conducted based on 45 countries over a 10-year period from 2003 to 2012. The *t*-values are in parentheses. Here * indicates $p < 0.10$, ** indicates $p < 0.05$, *** indicates $p < 0.01$.

	Panel A: Full Sample		Panel B: Emerging Markets		Panel C: Developed Markets	
	<i>Model (1)</i>	<i>Model (2)</i>	<i>Model (1)</i>	<i>Model (2)</i>	<i>Model (1)</i>	<i>Model (2)</i>
Intercept	-0.0423 (-1.30)	-0.0412 (-1.25)	-0.0525** (-2.10)	-0.0499** (-1.99)	0.1736 (1.05)	0.1223 (0.71)
MTB		-0.0003 (-0.21)		-0.0006 (-1.14)		0.0178 (1.16)
GDPG	0.0007 (0.52)	0.0007 (0.54)	0.0013** (2.04)	0.0014** (2.15)	0.0001 (0.03)	-0.0009 (-0.36)
GDPPC	0.0033 (1.00)	0.0033 (0.97)	0.0105*** (3.53)	0.0103*** (3.44)	-0.0237 (-1.48)	-0.0214 (-1.32)
INT	0.0008* (1.93)	0.0008* (1.92)	-0.0001 (-0.35)	-0.0001 (-0.35)	0.0004 (0.18)	0.0006 (0.25)
EX	0.000001 (0.38)	0.000001 (0.38)	-0.000001 (-1.05)	-0.000001 (-1.04)	-0.00003 (-1.37)	-0.00002 (-0.80)
TAX	-0.0007** (-2.49)	-0.0007** (-2.47)	-0.0001 (-0.56)	-0.0001 (-0.50)	0.0001 (0.23)	0.0002 (0.38)
ROE	0.0008* (1.66)	0.0008* (1.66)	0.0000 (-0.03)	0.0000 (-0.06)	0.0037*** (2.66)	0.0029* (1.84)
OPEN	0.0009*** (9.86)	0.0009*** (9.78)	0.000002 (0.02)	-0.000002 (-0.02)	0.0010*** (6.12)	0.0011*** (5.75)
SMC	0.0003*** (5.61)	0.0003*** (5.60)	0.00003 (0.59)	0.00003 (0.65)	0.0004*** (4.21)	0.0003*** (3.26)
Adj. R-Sq	0.5695	0.5679	0.1656	0.1677	0.6131	0.6141

Table 6. Determinants of the Mode of Foreign Investment

This table reports the regression results regarding the determinants of the mode of foreign investment, where Panel A focuses on FDI inflows and Panel B focuses on FPI inflows. The independent variables are defined as follows: *MTB* is the aggregate market-to-book ratio of listed companies in a country, *GDPG* is the annual GDP growth rate, *GDPPC* is the natural log of GDP per capita figures, *INT* is the real interest rate, *EX* is the exchange rate (local currency per US dollar), *TAX* is the tax rate, *ROE* is the aggregate return on equity ratio, *OPEN* is current account openness, and *SMC* is the total stock market capitalization to GDP ratio. Note that to control for potential endogeneity, lagged independent variables are used in all models. The panel regression is conducted based on 45 countries over a 10-year period from 2003 to 2012. The *t*-values are in parentheses. Here * indicates $p < 0.10$, ** indicates $p < 0.05$, *** indicates $p < 0.01$.

	Panel A: FDI Inflows as a Percentage of Total Foreign Investment Inflows			Panel B: FPI Inflows as a Percentage of Total Foreign Investment Inflows		
	<i>Full Sample</i>	<i>EM</i>	<i>DM</i>	<i>Full Sample</i>	<i>EM</i>	<i>DM</i>
Intercept	-0.3340 (-0.36)	-1.7298 (-1.39)	-0.9852 (-0.22)	1.3340 (1.45)	2.7298 (2.19)	1.9852 (0.44)
MTB	0.2411*** (5.96)	0.2358*** (8.78)	0.5341 (1.33)	-0.2411*** (-5.96)	-0.2358*** (-8.78)	-0.5341 (-1.33)
GDPG	0.0222 (0.63)	-0.0247 (-0.76)	0.0583 (0.88)	-0.0222 (-0.63)	0.0247 (0.76)	-0.0583 (-0.88)
GDPPC	0.0593 (0.64)	0.3241** (2.18)	0.0750 (0.18)	-0.0593 (-0.64)	-0.3241** (-2.18)	-0.0750 (-0.18)
INT	-0.0027 (-0.23)	-0.0164* (-1.71)	-0.1251* (-1.94)	0.0027 (0.23)	0.0164* (1.71)	0.1251* (1.94)
EX	0.00004 (-0.76)	-0.0001 (-1.45)	-0.0007 (-1.04)	0.00004 (0.76)	0.0001 (1.45)	0.0007 (1.04)
TAX	-0.0011 (-0.14)	0.0130 (1.17)	0.0067 (0.53)	0.0011 (0.14)	-0.0130 (-1.17)	-0.0067 (-0.53)
ROE	-0.0006 (-0.05)	-0.0049 (-0.48)	-0.0078 (-0.19)	0.0006 (0.05)	0.0049 (0.48)	0.0078 (0.19)
OPEN	0.0079*** (2.92)	-0.0111** (-2.01)	0.0151*** (2.97)	-0.0079*** (-2.92)	0.0111** (2.01)	-0.0151*** (-2.97)
SMC	-0.0020 (-1.34)	-0.0024 (-0.96)	-0.0051** (-2.07)	0.0020 (1.34)	0.0024 (0.96)	0.0051** (2.07)
Adj. R-Sq	0.1519	0.4129	0.1487	0.1519	0.4129	0.1487

Table 7. Determinants of Foreign Investment Inflows & Outflows: The Two-Stage Model

This table reports the regression results from the two-stage model, where Panel A focuses on the impact of stock market valuation on FDI outflows, Panel B focuses on the impact of stock market valuation on total foreign investment inflows, Panel C focuses on the impact of stock market valuation on FDI inflows, and Panel D focuses on the impact of stock market valuation on FPI inflows. The independent variables are defined as follows: *MTB* is the fitted aggregate market-to-book ratio of listed companies in a country, *GDPG* is the annual GDP growth rate, *GDPPC* is the natural log of GDP per capita figures, *INT* is the real interest rate, *EX* is the exchange rate (local currency per US dollar), *TAX* is the tax rate, *ROE* is the aggregate return on equity ratio, *OPEN* is current account openness, and *SMC* is the total stock market capitalization to GDP ratio. Note that to control for potential endogeneity, lagged independent variables are used in all models. The panel regression is conducted based on 45 countries over a 10-year period from 2003 to 2012. The *t*-values are in parentheses. Here * indicates $p < 0.10$, ** indicates $p < 0.05$, *** indicates $p < 0.01$.

	Panel A: FDI Outflows		Panel B: Total Foreign Investment Inflows		Panel C: FDI Inflows		Panel D: FPI Inflows	
	<i>EM</i>	<i>DM</i>	<i>EM</i>	<i>DM</i>	<i>EM</i>	<i>DM</i>	<i>EM</i>	<i>DM</i>
Intercept	-0.0542*** (-2.84)	-0.2831 (-1.13)	-0.0433 (-1.39)	0.1845 (1.07)	-1.4384 (-1.03)	-1.5218 (-0.29)	2.4384 (1.75)	2.5218 (0.48)
MTB	-0.0003 (-0.24)	0.0976** (1.97)	-0.0047* (-1.75)	-0.0134 (-0.33)	0.3602*** (2.96)	2.6097** (2.09)	-0.3602*** (-2.96)	-2.6097** (-2.09)
GDPG	-0.0001 (-0.10)	-0.0022 (-0.71)	0.0016** (1.98)	0.0001 (0.05)	-0.0146 (-0.4)	0.0750 (1.02)	0.0145 (0.40)	-0.0750 (-1.02)
GDPPC	0.0089*** (4.55)	0.0141 (0.59)	0.0105*** (2.87)	-0.0233 (-1.42)	0.2339 (1.42)	-0.0812 (-0.16)	-0.2339 (-1.42)	0.0812 (0.16)
INT	-0.0002 (-1.38)	-0.0005 (-0.13)	-0.0001 (-0.29)	0.0004 (0.18)	-0.0159 (-1.49)	-0.1322* (-1.75)	0.0159 (1.49)	0.1322* (1.75)
EX	0.0000001 (0.25)	-0.000003 (-0.08)	0.0000 (-0.80)	0.0000 (-1.33)	-0.0001 (-1.33)	-0.0011 (-1.50)	0.0001 (1.33)	0.0011 (1.50)
TAX	-0.0002* (-1.66)	-0.0005 (-0.70)	-0.0002 (-0.69)	0.0001 (0.23)	0.0236* (1.90)	0.0049 (0.33)	-0.0236* (-1.90)	-0.0049 (-0.33)
ROE	-0.0003 (-1.04)	-0.0016 (-0.43)	0.0001 (0.23)	0.0045* (1.67)	-0.0120 (-1.04)	-0.1295 (-1.56)	0.0120 (1.04)	0.1295 (1.56)
OPEN	0.0003*** (4.05)	0.0010*** (6.07)	0.00001 (0.08)	0.0010*** (5.90)	-0.0133** (-2.19)	0.0130** (2.58)	0.0133** (2.19)	-0.013** (-2.58)
SMC			0.0001 (0.90)	0.0004*** (3.91)	-0.0033 (-1.18)	-0.0061** (-2.14)	0.0033 (1.18)	0.0061** (2.14)
Adj. R-Sq	0.4193	0.3432	0.1750	0.6039	0.1122	0.1309	0.1122	0.1309