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Determinants of Foreign Direct Investment: A Sectoral and Institutional Approach

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Abstract

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Using a dataset which breaks down FDI flows into primary, secondary and tertiary sector investments and a GMM dynamic approach to address concerns about endogeneity, the paper analyzes various macroeconomic, developmental, and institutional/qualitative determinants of FDI in a sample of emerging market and developed economies. While FDI flows into the primary sector show little dependence on any of these variables, secondary and tertiary sector investments are affected in different ways by countries' income levels and exchange rate valuation, as well as development indicators such as financial depth and school enrollment, and institutional factors such as judicial independence and labor market flexibility. Finally, we find that the effect of these factors often differs between advanced and emerging economies.

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I. INTRODUCTION

There is a long-standing impression among policymakers that foreign direct investment is more conducive to long-run growth and development than other forms of capital inflows. Arguments for this hypothesis have been diverse, but most often based on the idea that FDI brings with it foreign technology and management skills, which can then be adapted by the host country in other contexts. This impression is strengthened by the fact that rapidly growing economies tend to absorb more FDI, though with FDI both contributing directly to growth and with foreign companies naturally eager to invest in rapidly growing economies, the direction of causality is not clear.

While the literature on FDI and growth is not fully conclusive, it is the case that FDI flows, particularly into emerging markets, have taken off in recent years. With companies increasingly able to capitalize on differentials in labor costs and increasingly interested in providing goods or services directly in often protected emerging markets, these flows are likely to continue increasing. It remains an open question, however, as to what pulls FDI into countries. It is intuitive that FDI should flow into countries with relatively stable economic conditions and strong institutions, and that investors should be concerned about political instability, inflexible regulations, and poor development indicators among prospective workers. But there is strangely little and scattershot evidence to support these arguments.

This paper tries to address these questions by studying two problems that might explain the poor results observed elsewhere in the literature. First, FDI flows are far from homogeneous. While countries are generally interested in attracting FDI into the primary sector (petroleum, mining, and agriculture) for revenue purposes, few policymakers feel that investment in the primary sector is conducive to creating employment¹. Instead, policymakers tend to focus on secondary and tertiary sector investment; believing that manufacturing investment can bring jobs to absorb labor from lower-productivity sectors, an especially important among emerging markets where agricultural employment remains important. The analysis below therefore distinguishes between primary, secondary and tertiary flows in assessing what factors attract FDI to economies.

Second, it is not clear that the factors that attract FDI to rich countries would be the same as those that attract FDI to emerging markets. Emerging markets tend to have relatively higher

¹ Whether this is true or not is open for debate: while mining investment may not create high-wage jobs in poor countries, Canada and Australia are important recipients of primary sector FDI and in both countries such investment has created high wage jobs. Clearly local conditions matter.

inflation, poorer institutions and lower development indicators than their rich counterparts. Since many emerging markets are nevertheless important destinations for FDI, it is clear that firms investing in emerging markets arrive at a different balance of considerations than those investing in developed economies, trading off greater macro stability and a better educated labor force, for example, in exchange for lower wages or access to a lucrative but protected market. To assess whether these differences operate systematically across macro level FDI flows, the results below are also checked for whether they differ between advanced and emerging economies.

The paper is organized as follows: Section II reviews previous studies about the determinants of FDI; Section III discusses data and methodology; Section IV presents empirical results; and Section V concludes the paper.

II. BACKGROUND

There is strong empirical evidence that FDI flows are less volatile than other capital flows (e.g., IMF, World Economic Outlook (2007)), and a widespread impression that FDI is somehow better for growth and development than other capital flows. While empirical support for FDI being better for growth is mixed, there is evidence that given certain country prerequisites, FDI does in fact lead to better growth outcomes (e.g., Alfaro (2003), Borensztein, de Gregorio and Lee (1995)). These qualities of FDI have led to substantial interest among policymakers on the factors that might attract FDI flows.

In looking at the firm level, researchers have asked why companies would want to service foreign markets through affiliate production rather than through exporting or licensing arrangements. Dunning(1993) outlines four motives for a firm to engage in this type of investment: access to resources, access to markets, efficiency gains, and acquisition of strategic assets. Policy shifts by governments could impact the efficiency gains companies might experience, and have an effect on the ability of companies to access markets. This in turn motivates the literature on whether country-level factors and conditions can also lead to stronger flows. Whether macroeconomic and other national-level factors can account for cross-country differences in FDI inflows is the focus of the rest of this paper.

Previous work has looked at the relationship of FDI with several macroeconomic variables. Some that might be thought to have a connection to FDI flows are the size and growth potential of the host market, economic stability, the degree of openness of the host economy, and income level, as well as the quality of institutions and level of development.

Market size and growth potential

Larger host countries' markets may be associated with higher foreign direct investment due to larger potential demand and lower costs due to scale economies. For example, Resmini (2000), looking into manufacturing FDI, finds that countries in Central and Eastern Europe with larger populations tend to attract more FDI, while Bevan and Eastin (2000) present similar results; transition economies with larger economies also tend to attract more FDI.

Openness

On one hand, a decrease in openness might be associated with more horizontal FDI, as investing firms might benefit from circumventing trade barriers through building production sites abroad. But Resmini (2000), studying manufacturing investment in Central and Eastern Europe, finds that these largely vertical FDI flows, benefit from increasing openness, as might be expected in a sector for which international trade flows in intermediate and capital goods are important. Singh and Jun (1995) also find that export orientation is very important in attracting FDI, and link this to the rising complementarity of trade and FDI flows.

Exchange Rate Valuation

A weaker real exchange rate might be expected to increase vertical FDI as firms take advantage of relatively low prices in host markets to purchase facilities or, if production is reexported, to increase home-country profits on goods sent to a third market. Froot and Stein (1991) find evidence of the relationship: a weaker host country currency tends to increase inward FDI within an imperfect capital market model as depreciation makes host country assets less expensive relative to assets in the home country. Blonigen (1997) makes a "firm-specific asset" argument to show that exchange rate depreciation in host countries tend to increase FDI inflows. But on the other hand, a stronger real exchange rate might be expected to strengthen the incentive of foreign companies to produce domestically: the exchange rate is in a sense a barrier to entry in the market that could lead to more horizontal FDI. However, this hypothesis does not appear to have attracted much support in the empirical literature.

Clustering effects

Studies have identified clustering effects: foreign firms appear to gather together either due to linkages among projects or due to herding as a larger existing FDI stock is regarded as a signal of a benign business climate for foreign investors. FDI may also benefit from the presence of external scale economies, where new investors mimic past investment decisions by other investors in choosing where to invest. By clustering with other firms, new investors benefit from positive spillovers from existing investors in the host country. Evidence for these effects is widespread, with Wheeler and Mody (1992) in the case of U.S. firms, Barrell

and Pain (1999) in the Western European context, and Campos and Kinoshita (2003) in the transition economies, all finding empirical evidence of agglomeration effects.

Political stability

Surveys of investors have indicated that political and macroeconomic stability is one of the key concerns of potential foreign investors. However, empirical results are somewhat mixed. Wheeler and Mody (1992) find that political risk and administrative efficiency are insignificant in determining the production location decisions of U.S. firms. On the other hand, Root and Ahmed (1979), looking at aggregate investment flows into developing economies in the late 1960s, and Schneider and Frey (1985), using a similar sample for a slightly later time period, find that political instability significantly affects FDI inflows.

Institutions

Institutional quality is a likely determinant of FDI, particularly for less-developed countries, for a variety of reasons. First, good governance is associated with higher economic growth, which should attract more FDI inflows. Second, poor institutions that enable corruption tend to add to investment costs and reduce profits. Third, the high sunk cost of FDI makes investors highly sensitive to uncertainty, including the political uncertainty that arises from poor institutions. Unfortunately, it is hard to measure institutional factors, and empirical results are vague. For example, regulatory framework, bureaucratic hurdles and red tape, judicial transparency, and the extent of corruption in the host country are found insignificant by Wheeler and Mody (1992) in their analysis of firm-level U.S. data, though Wei (2000) finds that corruption significantly adds to firm costs and impedes FDI inflows. The two papers use different measures of institutional quality, and look at different types of data (investing firms versus aggregate FDI inflows), which might explain this difference.

The coverage of countries also varies among existing studies. Some papers (e.g., Schneider and Frey (1985)) look at a wide spectrum of developing countries, while others (e.g., Resmini (2000)) use a smaller regional sample. Papers focusing on firm level data are almost by necessity limited to a single country, most often the United States. Another concern arising from studies focused only on advanced economies is whether lessons will apply to developing economies (and perhaps to a lesser extent, vice versa). Wheeler and Mody (1992) find some difference in investment decisions by firms in developing and developed economies.

Finally, studies based on macro-level FDI flows generally focus on gross investment flows into countries, requiring the aggregation of FDI across the primary, secondary and tertiary

sectors, when it is clear from firm-level analysis such as that in Wheeler and Mody (1992) that investment decisions across industries may have quite different determinants.

III. DATA AND METHODOLOGY

The data used below are annual FDI data with observations from 1985 to 2008 for 27 advanced and EM countries², but most results focus on the last 10 years due to limits on data availability for institutional/qualitative variables. The analysis focuses on 26 middle- and high-income economies accounting for the vast majority of global FDI flows, particularly in the secondary and tertiary sectors, cutting a middle path between a deeper analysis of regional or advanced-economy only flows, and an extremely broad sample which could overweight FDI flows into relatively small and less diversified economies. Data on net FDI flows broken down into primary, secondary, and tertiary flows are from UNCTAD. While an ideal analysis would use investment-level data classified by industry and available across a wide variety of countries, such a dataset is not readily available, and using macro-level FDI data disaggregated into primary, secondary, and tertiary flows allows some distinctions to be drawn between the determinants of extractive industries, manufacturing, and services. Finally, institutional/qualitative indicators are mainly from the Global Investment Report produced by the World Economic Forum and the World Bank's development indicators.

The dependent variable in the specifications below is the inflow of FDI as a share of nominal GDP. A first pass of the data looks at which macroeconomic variables are associated with higher FDI flows, based on the channels laid out above. The variables include openness, the log level of the multilateral real exchange rate, trailing 3-year moving average inflation, the stock of FDI, real GDP growth and the log level of GDP per capita. GDP per capita and real GDP growth proxy for host countries' market size and growth potential, the stock of FDI stands for the degree of clustering, and inflation proxies for macroeconomic stability³. Openness is measured as the share of goods and services trade in GDP.

² The countries included in the sample are Argentina, Australia, Brazil, Canada, China, Colombia, the Czech Republic, France, Germany, Hungary, India, Indonesia, Italy, Japan, Korea, Malaysia, Mexico, the Philippines, Poland, Russia, South Africa, Saudi Arabia, Spain, Thailand, Turkey, the United Kingdom, and the United States.

³ Including nominal GDP, either in USD or PPP terms, and in levels or logs, produced similar but less robust results to those using GDP per capita. These weaker results are perhaps not surprising, as the dependent variable is the ratio of FDI to nominal GDP: with the overall size of GDP already controlled for, income per capita is a clear measure of market scope.

The institutional and qualitative variables used include labor market flexibility, infrastructure quality, judicial independence, legal system efficiency, and financial depth. School enrollment at the primary, secondary and tertiary levels is also included. Labor market flexibility is measured by a hiring and firing cost index.

There is multicollinearity between these variables, at least in some cases, making specifications including a number of them somewhat difficult to interpret. Other practitioners have addressed this by establishing a baseline specification to control for important macroeconomic effects, and then adding each of the qualitative variables in turn, which is the approach used below.

Measuring the relationship between FDI flows and many of the macroeconomic variables listed above, especially GDP per capita and real GDP growth but conceivably also openness and the real effective exchange rate, raises some endogeneity concerns. To address these, the results below are estimated using Generalized Method of Moments (GMM) dynamic estimator based on the Arellano-Bond methodology.

The Arellano-Bond methodology specifies a dynamic model which allows for time-invariant country-specific effects. This seems plausible in the case of FDI, where variables outside the analysis, such as political regime and distance to home countries display little, if any, variation over the period of the analysis.

The equation estimated below is:

$$y_{i,t} = \alpha + \lambda y_{i,t-1} + X'_{i,t} \beta + \mu_i + v_{i,t} \quad (1)$$

where y denotes FDI as a share of GDP, X is the vector of macroeconomic and institutional/qualitative variables, and μ represents the time-invariant country-specific effects.

Taking first difference of equation (1) eliminates the time-invariant country-specific effects, generating the following equation:

$$y_{i,t} - y_{i,t-1} = \alpha + \lambda(y_{i,t-1} - y_{i,t-2}) + (X'_{i,t} - X'_{i,t-1})\beta + (v_{i,t} - v_{i,t-1}) \quad (2)$$

To account for possible endogeneity between the explanatory variables $X_{i,t}$ and the dependent variable $y_{i,t}$, the equation is estimated using as instruments the lagged values of the left- and right-hand side variables in levels. These instruments are valid if the error term v is not serially correlated. All specifications, in which the growth-related macroeconomic variables

but not the institutional variables are used as instruments, pass Sargan tests for overidentifying restrictions, providing evidence of validity of the choice of instruments.

There are some statistical shortcomings to a straightforward instrumental variables estimation of the above equation, namely that in a small sample with some persistent explanatory variables, lagged levels make weak instruments for the regression when run in differences. To address this weakness, Blundell and Bond (1988) developed the system GMM dynamic model, which combines the regression in first differences above with an estimation run in levels, using both lagged levels and lagged differences as instruments. The specific moment conditions estimated and a more thorough discussion of the methodology are in the appendix.

IV. RESULTS

A. Macroeconomic Variables and FDI

The baseline macroeconomic specification used across the regressions includes openness, GDP growth, average inflation over the three previous years, the logs of GDP per capita and the real effective exchange rate, and (to estimate clustering effects) the stock of FDI. Running the same specification with slightly different dependent variables did not alter the main result: similar conclusions can be drawn from regressions using the ratio of FDI to fixed capital formation or the moving average of the ratio of FDI to nominal GDP, or regressions using the log of FDI.

For total FDI flows, the results are not particularly strong (Table 1). The clustering effects noted in a variety of other studies are also visible here with the coefficient on FDI stock, and this result tends to hold up broadly in other cases. For openness and the exchange rate, which appear significant in a variety of other studies, the results are more puzzling. For the exchange rate, it may be that the measure used here, the IMF's real effective exchange rate, is different from the values used in other studies, which in many cases look at firms' decisions denominated in a single currency. The result for openness, which is generally measured as measured here, is more difficult to dismiss. It is possible that the reason for these poor results for macroeconomic variables is the aggregation of heterogeneous FDI inflows which have different, and at times opposing, determinants. This can be addressed by looking at sectoral flows.

The relationship between the macroeconomic variables here and primary sector FDI is minimal. This is not surprising, as investments in resource extraction have little connection to the broader macroeconomy. In most countries in the sample, mining and petroleum account for the largest share of primary sector FDI. With outputs priced in dollars rather than

domestic currency, and with relatively little domestic labor content or relation with domestic financial systems, macroeconomic considerations are secondary to the location of natural resources in determining where such investments will go. Naturally, at the margins these issues will matter: even primary sector investment fails in countries with no centralized political control or fundamental macroeconomic dislocation. But all the countries in this sample are well above that threshold, and it is therefore intuitive that additional macroeconomic improvements make little difference in attracting more primary sector FDI.

Secondary sector FDI, on the other hand, has more macroeconomic linkages. A more depreciated real effective exchange rate is good for manufacturing investment, and countries with higher GDP growth have (weakly) more manufacturing investment. However, richer countries appear to attract a lower share of FDI relative to GDP than poor countries. Since lower wage costs are an important motivator of manufacturing FDI, this is also an intuitive result. Finally, openness does not appear to be linked to secondary sector FDI, though given that some FDI is intended to supply domestic markets while other flows are aimed at export markets, this may not be surprising⁴.

Finally, FDI into the tertiary sector is also found to be linked to macroeconomic variables, but has a somewhat different set of determinants. While openness did not appear to matter for primary or secondary sector FDI, it is very important for FDI in services even when the real effective exchange rate is controlled for, with a positive and highly significant coefficient. Since most services FDI is likely to be horizontal (i.e., aimed at the market in which the investment is made) rather than vertical (i.e., intended for export), this is somewhat surprising, but the result is strong enough for this sector to appear when all three sectors are aggregated into total FDI. Since services flows have little to do with trade flows per se, it is not obvious why this should be the case. It is possible, however, that openness to trade is correlated with the type of economic liberalization that also generates a sound economic environment for the service sector.

⁴ Dropping the real exchange rate does not affect this result.

Table 1. FDI and Macroeconomic Variables

VARIABLES	1 Total FDI	2 Primary FDI	3 Secondary FDI	4 Tertiary FDI
Openness	3.83 (4.137)	-2.54* (1.455)	3.35* (1.724)	48.25*** (10.117)
Log. Real Exchange Rate	-0.75 (0.637)	-0.06 (0.227)	-0.96*** (0.288)	3.89*** (1.271)
Real GDP Growth	0.03 (0.033)	0.00 (0.012)	0.02* (0.014)	0.11*** (0.033)
FDI Stock	3.36*** (1.067)	0.83** (0.348)	2.24*** (0.424)	3.89** (1.696)
Average Inflation	0.00 (0.002)	-0.00 (0.001)	-0.00 (0.001)	-0.00 (0.001)
Log. GDP per capita	0.00 (0.100)	-0.00 (0.035)	-0.12*** (0.043)	-1.10** (0.455)
Observations	319	320	356	330
Sargan p-value	0.95	0.95	0.55	0.21

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The real exchange rate is also important for the tertiary sector. While secondary sector FDI appears to be drawn into countries with more depreciated real exchange rates, the opposite is true for tertiary FDI, which is at least weakly associated with more appreciated real exchange rates, with a coefficient larger than that of secondary FDI but of the opposite sign. The reasons for this difference are not obvious, but it could be that manufacturing investment is attracted by the lower wages associated with the weaker real exchange rate, while investment in services is more attractive in markets with higher relative wages and profits. And finally, the stock of FDI in all three sectors has the same effect: the clustering effects discussed above would appear to be the only determinant that shows an important linkage to each of these different FDI flows.

A surprising result across all three sectors is that inflation, which previous studies have found has some impact on FDI, does not appear to have a strong effect in any sector, at least once the real effective exchange rate is controlled for. The measure used here is the average CPI inflation over the past three years, but other measures, such as longer and shorter horizons, or deviation from average inflation, also had little relationship with FDI flows in any sector. It is possible that this is due to the current sample being biased toward relatively stable emerging markets and advanced economies, but given that many of the emerging markets in this sample have higher rates of inflation than the advanced economies, this would imply that the benefit in reducing inflation from moderate to low levels is minimal in the highly specific terms of attracting additional FDI.

The salient point is that determinants of FDI flows differ strongly across sectors. While a depreciated currency is associated with more manufacturing FDI, a stronger one is associated with more services investment. Openness is important for services, while GDP per capita is a more important driver of manufacturing. Finally, no macroeconomic variables appear to be strongly tied to primary sector FDI at all.

B. Qualitative Variables

The next set of regressions includes each of the qualitative variables successively in the specification while controlling for macroeconomic variables specified above.

The qualitative variables included in this set of regressions represent a wide range of institutional and development factors that might be expected to affect the willingness of investors to locate foreign investment in the target country. The variables included are a measure of labor flexibility (based on hiring and firing costs), infrastructure quality, financial depth, judicial independence, legal system efficiency, and enrollment rates for primary, secondary, and tertiary education.

Table 2. Total FDI and Institutions

Dependent Variable	1	2	3	4	5	6	7	8
Explanatory Variables	Labor	Judicial	Legal	Fin. Depth	Infrastructure	Prim. Enroll.	Second. Enroll.	Tert. Enroll
Openness	-0.21 (4.293)	-2.49 (5.539)	-5.46 (7.194)	2.89 (3.883)	0.96 (4.702)	3.65 (5.956)	1.31 (5.767)	1.19 (5.329)
REER	-0.34 (0.731)	-0.11 (0.975)	0.33 (0.974)	-0.95 (0.608)	-0.49 (0.785)	-0.76 (0.861)	-1.00 (0.925)	-0.41 (0.918)
GDP growth	-0.01 (0.038)	0.02 (0.055)	0.09 (0.069)	0.02 (0.032)	-0.01 (0.041)	0.03 (0.043)	0.04 (0.048)	0.03 (0.048)
FDI Stock	4.61*** (1.175)	5.02*** (1.504)	7.51*** (1.714)	4.49*** (1.044)	4.19*** (1.229)	4.54*** (1.361)	5.01*** (1.556)	5.08*** (1.477)
Avg. Inflation	0.00 (0.003)	-0.01 (0.020)	-0.03 (0.025)	-0.00 (0.002)	0.00 (0.003)	-0.00 (0.019)	-0.00 (0.025)	-0.01 (0.023)
Qualitative Var.	0.12 (0.131)	0.19 (0.155)	0.05 (0.191)	0.12 (0.172)	0.03 (0.146)	0.01 (0.018)	-0.01 (0.010)	-0.03*** (0.010)
Constant	2.69 (3.343)	1.89 (4.242)	-0.62 (4.015)	4.62 (2.837)	3.50 (3.549)	1.54 (5.187)	4.92 (4.130)	0.78 (4.158)
Sargan p-value	0.59	0.566	0.628	0.576	0.612	0.765	0.946	0.759
Observations	253	189	129	296	242	209	211	180

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Results for FDI in the primary sector (as well as for total FDI as a comparator) are shown in Tables 2 and 3. With the exception of a counter-intuitively negative finding for tertiary enrollment, none of the developmental or institutional variables appear to have any influence

either on total FDI flows or on inflows into the primary sector. As with the macroeconomic specification, however, the stock of total FDI does appear to be associated with higher flows of FDI. As above, the results for the primary sector are intuitive, as enclave investments with little contact with the broader economy would not be expected to be affected by the development of the financial system or the degree of school enrollment in the population of the host country.

Table 3. Primary FDI and Institutions

Dependent Variable	Primary FDI as a share of GDP							
	1	2	3	4	5	6	7	8
Explanatory Variables	Labor	Judicial	Legal	Fin. Depth	Infrastructure	Prim. Enroll.	Second. Enroll.	Tert. Enroll
Openness	-2.37 (1.561)	-2.13 (1.881)	-2.81 (2.559)	-2.15 (1.429)	-2.15 (1.717)	-2.68 (2.311)	-2.96 (2.027)	-2.96 (2.015)
REER	0.08 (0.269)	0.20 (0.337)	0.22 (0.362)	-0.01 (0.225)	0.01 (0.288)	-0.03 (0.339)	-0.02 (0.330)	-0.11 (0.352)
GDP growth	-0.02* (0.014)	-0.03* (0.019)	-0.02 (0.026)	-0.02 (0.012)	-0.02 (0.015)	-0.02 (0.017)	-0.02 (0.017)	-0.03 (0.019)
FDI Stock	0.74* (0.390)	0.51 (0.484)	0.38 (0.569)	0.85** (0.348)	0.69* (0.412)	0.91* (0.499)	0.94* (0.500)	0.78 (0.508)
Avg. Inflation	-0.00 (0.001)	-0.00 (0.007)	-0.00 (0.009)	-0.00 (0.001)	-0.00 (0.001)	-0.00 (0.007)	-0.01 (0.009)	-0.01 (0.009)
GDP per capita	-0.02 (0.041)	-0.02 (0.065)	-0.03 (0.084)	-0.01 (0.035)	-0.03 (0.069)	-0.05 (0.070)	-0.02 (0.065)	-0.06 (0.079)
Qualitative Var.	0.07 (0.049)	-0.03 (0.054)	0.01 (0.073)	0.05 (0.064)	0.01 (0.053)	-0.00 (0.007)	-0.00 (0.003)	-0.00 (0.004)
Sargan p-value	0.544	0.046	0.635	0.536	0.551	0.938	0.897	0.831
Observations	254	190	130	297	243	210	212	181

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The results are different for the secondary sector (Table 4). While most of the qualitative variables are not significant, two do stand out: labor market flexibility and financial depth. In both cases, the signs are as expected: economies with deeper financial systems and with more labor market flexibility have higher levels of FDI. As this specification controls for (log) GDP per capita, it is important to note that the coefficient on that variable is also significant, and negative. That is, higher levels of income are associated with lower average secondary sector FDI flows, as might be expected if higher levels of income are correlated with higher unit labor costs. At a given level of per capita income, a more flexible labor market and greater financial depth lead to more FDI in manufacturing.

It is interesting to note that other variables that would appear to be important in firms' investment decisions do not appear significant in determining FDI flows. School enrollment, the legal system, and most crucially, infrastructure quality appear to have little effect on FDI flows. The enrollment result is perhaps surprising, as Borensztein, de Gregorio and Lee (1995) find that FDI has its strongest effect on growth in countries with human capital above

a certain level. While it may be that the effect of FDI in growth simply has different determinants from FDI flows themselves, it may also be the case that the sample here, including many developed economies as well as emerging markets with relatively high levels of human capital, shows less variation in human capital and thus less of an impact on FDI flows.

Table 4. Secondary FDI and Institutions

Dependent Variable	Secondary FDI as a share of GDP							
	1	2	3	4	5	6	7	8
Explanatory Variables	Labor	Judicial	Legal	Fin. Depth	Infrastructure	Prim. Enroll.	Second. Enroll.	Tert. Enroll
Openness	1.70 (1.950)	1.54 (2.500)	0.12 (3.743)	1.77 (1.701)	2.85 (2.169)	3.95 (2.597)	1.91 (2.537)	2.03 (2.518)
REER	-0.73** (0.345)	-0.68 (0.468)	-0.55 (0.556)	-0.98*** (0.285)	-0.86** (0.377)	-0.80* (0.430)	-0.89** (0.443)	-0.69 (0.462)
GDP growth	0.01 (0.018)	0.04 (0.025)	0.06 (0.040)	0.02 (0.014)	0.02 (0.019)	0.02 (0.020)	0.03 (0.022)	0.03 (0.023)
FDI Stock	2.18*** (0.511)	2.44*** (0.675)	2.91*** (0.867)	2.36*** (0.435)	2.07*** (0.550)	2.06*** (0.623)	2.57*** (0.669)	2.48*** (0.663)
Avg. Inflation	-0.00 (0.001)	-0.01 (0.006)	-0.02* (0.012)	-0.00 (0.001)	-0.00 (0.001)	-0.00 (0.007)	-0.00 (0.009)	-0.01 (0.006)
GDP per capita	-0.15*** (0.050)	-0.12 (0.078)	-0.12 (0.118)	-0.12*** (0.041)	-0.10 (0.083)	-0.08 (0.069)	-0.08 (0.081)	-0.04 (0.093)
Qualitative Var.	0.14** (0.061)	-0.06 (0.069)	-0.14 (0.109)	0.25*** (0.081)	-0.01 (0.069)	0.01 (0.008)	-0.00 (0.004)	-0.01* (0.005)
Sargan p-value	0.714	0.696	0.667	0.671	0.758	0.928	0.942	0.858
Observations	271	201	134	333	260	224	225	200

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

For tertiary FDI, a different subset of qualitative variables is significant, with judicial independence and infrastructure quality having significant and expected signs (Table 5). As with secondary FDI, factors associated with more developed economies, in this case a more independent judiciary and improved infrastructure, lead to higher FDI, even controlling for the level of GDP per capita. In fact, GDP per capita is generally significant and negative, at least in those specifications with significant qualitative variables, implying that while richer economies tend to get less FDI relative to GDP, those richer economies with better infrastructure or more independent judiciaries tend to get more, once income is controlled for.

Table 5. Tertiary FDI and Institutions

Dependent Variable Explanatory Variables	Tertiary FDI as a share of GDP							
	1 Labor	2 Judicial	3 Legal	4 Fin. Depth	5 Infrastructure	6 Prim. Enroll.	7 Second. Enroll.	8 Tert. Enroll
Openness	39.26*** (9.703)	34.93** (15.046)	70.47*** (19.656)	17.51*** (6.453)	39.83*** (11.548)	35.84*** (12.912)	41.69*** (15.301)	39.49*** (13.374)
REER	4.64*** (1.097)	3.63** (1.710)	2.91 (2.224)	1.83** (0.744)	5.22*** (1.201)	4.22** (1.638)	4.57** (1.873)	2.23* (1.344)
GDP growth	0.08** (0.030)	0.06 (0.047)	0.12* (0.061)	0.03 (0.023)	0.09** (0.034)	0.08** (0.037)	0.09* (0.046)	0.05 (0.040)
FDI Stock	2.53* (1.447)	-0.77 (2.493)	4.48 (3.493)	3.18*** (1.173)	1.56 (1.610)	1.68 (2.381)	0.62 (2.627)	-0.60 (2.313)
Avg. Inflation	-0.00 (0.002)	-0.02 (0.017)	-0.04 (0.024)	0.00 (0.001)	-0.00 (0.002)	-0.02 (0.016)	-0.03 (0.022)	-0.02 (0.014)
GDP per capita	-1.40*** (0.477)	-1.06 (0.703)	-1.51* (0.872)	-0.21 (0.322)	-1.53*** (0.501)	-1.51* (0.775)	-1.73* (0.887)	-0.23 (0.669)
Qualitative Var.	-0.23 (0.190)	0.62** (0.292)	0.46 (0.409)	0.02 (0.568)	0.45** (0.228)	0.03 (0.029)	-0.03 (0.028)	-0.02 (0.028)
Sargan p-value	0.202	0.22	0.008	0.037	0.341	0.166	0.075	0.089
Observations	246	176	110	307	234	165	166	163

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

One puzzling result relates to school enrollment. Both secondary and tertiary enrollment indices are marginally associated with slightly lower levels of FDI in services. This is counterintuitive, but it could be that current levels of enrollment do not reflect the level of skills attainment in the economy, or that enrollment in tertiary education in particular is too broad a criterion, and does not reflect the level of specific skills that workers would need to have to encourage more foreign investment in services.

C. Developed versus Developing Economies

The next set of regressions looks at whether the results laid out above are affected by distinguishing between developed and developing economies.

The regressions in this section make this distinction by multiplying a dummy variable for advanced economies by the macroeconomic variables used in the specifications above, and including this along with the macro variables. That is, the coefficient on the macroeconomic variable represents the effect of the variable on emerging markets, but the effect on developed economies is the sum of that coefficient and the coefficient on the interaction term (Table 6).

Table 6. FDI and Macroeconomic Variables-By Level of Development

VARIABLES	1	2	3	4
	Total FDI	Primary FDI	Secondary FDI	Tertiary FDI
Openness	0.94 (4.051)	-2.64* (1.458)	1.74 (1.804)	13.55* (7.377)
REER	-1.47** (0.646)	0.05 (0.232)	-1.29*** (0.307)	1.88* (0.981)
GDP Growth	-0.01 (0.032)	-0.02* (0.012)	0.02 (0.014)	0.01 (0.025)
FDI Stock	4.13*** (1.182)	0.53 (0.390)	2.56*** (0.505)	1.50 (1.447)
Avg. Inflation	-0.00 (0.001)	-0.00 (0.001)	-0.00 (0.001)	-0.00 (0.001)
GDP per capita	0.22 (0.145)	0.01 (0.053)	-0.02 (0.060)	0.08 (0.299)
<i>multiplied by developed country dummy</i>				
Openness	12.16 (11.953)	10.20** (4.426)	-3.86 (5.667)	22.54 (18.600)
REER	-0.57 (1.067)	-0.55 (0.395)	0.06 (0.508)	6.37** (2.790)
GDP Growth	0.15 (0.099)	0.03 (0.036)	-0.01 (0.040)	0.03 (0.059)
FDI Stock	0.41 (1.757)	0.55 (0.650)	-0.69 (0.806)	6.96** (2.696)
Avg. Inflation	-0.13 (0.119)	0.01 (0.044)	0.01 (0.057)	-0.20** (0.096)
GDP per capita	0.11 (0.447)	0.17 (0.165)	-0.03 (0.213)	-2.27*** (0.732)
Constant	5.79* (3.010)	0.00 (1.083)	6.28*** (1.445)	
Sagan p-value	0.448	0.399	0.594	0.048
Observations	319	320	355	329

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

For primary sector FDI, the evidence remains that macroeconomic variables have little impact on flows. The openness coefficient is significantly stronger for developed economies than developing economies; however, this may be due to the fact that in this sample, the developed economies with the highest levels of inward primary sector FDI are countries such as Canada and Australia. These relatively small developed economies have fewer large corporations in extractive industries than countries like the United States and UK, with less primary sector FDI (at least as a share of GDP); thus their trade openness and their willingness to allow foreign companies to invest in domestic extractive industries probably stem from the same source, rather than being causally linked.

Table 7. Total FDI and Qualitative Determinants-By Level of Development

Dependent Variable	1	2	3	4	5	6	7	8
	Total FDI as a share of GDP							
Explanatory Variables	Labor	Judicial	Legal	Fin. Depth	Infrastructure	Prim. Enroll.	Second. Enroll	Tert. Enroll
Openness	-1.97 (4.352)	-5.83 (5.739)	-10.17 (7.557)	1.70 (3.956)	-3.68 (5.090)	1.66 (6.051)	-0.70 (5.826)	-0.82 (5.400)
REER	-0.40 (0.753)	-0.53 (0.991)	0.37 (0.987)	-0.98 (0.607)	-0.23 (0.796)	-0.69 (0.864)	-0.87 (0.919)	-0.42 (0.908)
GDP growth	-0.01 (0.038)	0.04 (0.058)	0.06 (0.070)	0.01 (0.032)	-0.01 (0.042)	0.01 (0.044)	0.03 (0.049)	0.02 (0.048)
FDI Stock	4.36*** (1.178)	4.58*** (1.522)	7.69*** (1.711)	4.72*** (1.057)	3.98*** (1.236)	4.11*** (1.386)	4.81*** (1.596)	5.10*** (1.465)
Avg. Inflation	-0.00 (0.003)	-0.01 (0.020)	-0.04 (0.024)	-0.00 (0.002)	0.00 (0.003)	-0.01 (0.019)	-0.02 (0.025)	-0.02 (0.024)
GDP per capita	0.04 (0.186)	0.13 (0.253)	-0.04 (0.296)	0.11 (0.126)	-0.02 (0.204)	0.30 (0.249)	0.24 (0.224)	0.62** (0.259)
Qualitative Var.	0.20 (0.150)	0.47** (0.224)	0.32 (0.289)	0.26 (0.201)	0.30 (0.201)	0.01 (0.019)	0.00 (0.011)	-0.03*** (0.010)
Qualitative Var. dummy	-0.13 (0.115)	-0.23 (0.139)	-0.18 (0.179)	-0.50 (0.365)	-0.17* (0.100)	-0.01 (0.005)	-0.01 (0.005)	-0.01* (0.008)
Sargan p-value	0.674	0.647	0.376	0.483	0.587	0.842	0.935	0.675
Observations	253	189	129	296	242	209	211	180

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The results for secondary sector FDI also are not changed in an important way, though GDP per capita no longer appears to be as important. Beyond that, there are no significant differences in how macro variables affect FDI in developing economies from how they affect inflows into developed economies.

For the tertiary sector, on the other hand, the results are quite different. Under the original specification, more open economies and economies with large stocks of FDI attracted the most additional investment. Once these results are allowed to differ between developed and developing economies, however, openness appears to be less important and only barely significant for all economies, while the FDI stock only appears to be important for developed economies. The real effective exchange rate is now very important for developed economies, as is GDP per capita (with poorer economies receiving more FDI), while inflation is now marginally important. Tertiary FDI in developing economies does not appear to be particularly strongly influenced by macroeconomic variables at all. This is not the case among developed economies, where a stronger exchange rate and greater stock of FDI lead to significantly more inflows. Also, among developed economies, those with lower levels of GDP per capita attract more inflows.

Thus macroeconomic variables are important for both secondary and tertiary sector FDI, but while stronger macro conditions have similar marginal effects on secondary FDI among both

advanced and emerging economies, for tertiary FDI, stronger macroeconomic conditions are much more important for attracting FDI to advanced economies.

Table 8. Primary FDI and Qualitative Determinants-By Level of Development

Dependent Variable Explanatory Variables	1	2	3	Primary FDI as a share of GDP			7	8
	Labor	Judicial	Legal	Fin. Depth	Infrastructure	Prim. Enroll.	Second. Enroll	Tert. Enroll
Openness	-2.29 (1.574)	-1.76 (1.964)	-2.27 (2.707)	-1.84 (1.448)	-2.65 (1.866)	-2.78 (2.343)	-3.04 (2.081)	-3.19 (2.069)
REER	0.12 (0.275)	0.11 (0.353)	0.33 (0.380)	-0.01 (0.225)	-0.00 (0.296)	0.01 (0.343)	0.01 (0.334)	-0.12 (0.353)
GDP growth	-0.02* (0.014)	-0.00 (0.020)	-0.02 (0.027)	-0.01 (0.012)	-0.02 (0.015)	-0.02 (0.017)	-0.02 (0.017)	-0.03 (0.019)
FDI Stock	0.78* (0.398)	0.72 (0.528)	0.24 (0.625)	0.83** (0.348)	0.73* (0.431)	0.84 (0.512)	0.95* (0.529)	0.74 (0.517)
Avg. Inflation	-0.00 (0.001)	-0.00 (0.007)	-0.00 (0.009)	-0.00 (0.001)	-0.00 (0.001)	-0.01 (0.008)	-0.01 (0.009)	-0.01 (0.009)
GDP per capita	-0.06 (0.068)	-0.08 (0.088)	-0.08 (0.113)	-0.06 (0.047)	-0.05 (0.076)	-0.01 (0.099)	-0.04 (0.082)	-0.03 (0.103)
Qualitative Var.	0.05 (0.055)	-0.09 (0.078)	-0.03 (0.110)	0.00 (0.073)	0.04 (0.073)	-0.00 (0.007)	-0.00 (0.004)	-0.00 (0.004)
Qualitative Var. dummy	0.03 (0.042)	0.06 (0.048)	0.03 (0.069)	0.18 (0.134)	-0.01 (0.036)	-0.00 (0.002)	0.00 (0.002)	-0.00 (0.003)
Constant	-0.01 (1.271)	0.62 (1.555)	-0.43 (1.625)	0.66 (1.066)	0.55 (1.410)	0.48 (2.156)	0.84 (1.558)	1.26 (1.656)
Sargan p-value	0.285	0.188	0.239	0.43	0.248	0.827	0.733	0.759
Observations	254	190	130	297	243	210	212	181

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The final set of regressions looks at whether the qualitative variables discussed in the previous section affect developed economies differently from emerging markets. For total and primary sector FDI, these variables appear to have little relationship to flows (Tables 7 and 8); the section below thus focuses on secondary and tertiary FDI.

In the case of secondary sector FDI, there are important differences between how these variables affect emerging markets compared to developed economies (Table 9). As above, both labor market flexibility and financial depth are important determinants of FDI. However, in both cases, higher scores on these variables are strongly associated with increased secondary sector flows to emerging markets, but the effect is less for advanced economies, and actually negative for financial depth. That is, controlling for per capita income, the effect of increased labor market flexibility on the ability of an emerging market to attract FDI is about three times greater than the effect on an advanced economy. And for financial depth, while deeper financial markets attract significantly more FDI to emerging markets, they have a significantly negative effect on the ability of advanced economies to attract FDI, or at least, advanced economies appear to attract significantly less FDI than emerging markets with similar depth of financial markets.

Table 9. Secondary FDI and Qualitative Determinants-By Level of Development

Dependent Variable Explanatory Variables	1	2	3	4	5	6	7	8
	Labor	Judicial	Legal	Secondary FDI as a share of GDP				
				Fin. Depth	Infrastructure	Prim. Enroll.	Second. Enroll.	Tert. Enroll
Openness	1.41 (1.935)	1.13 (2.519)	0.05 (3.910)	-0.26 (1.697)	0.75 (2.286)	3.51 (2.588)	1.76 (2.543)	1.60 (2.549)
REER	-0.94*** (0.344)	-0.94* (0.482)	-0.75 (0.564)	-1.18*** (0.277)	-0.89** (0.382)	-0.90** (0.430)	-0.97** (0.444)	-0.84* (0.462)
GDP growth	0.01 (0.017)	0.04 (0.026)	0.05 (0.041)	0.00 (0.014)	0.02 (0.019)	0.02 (0.020)	0.02 (0.022)	0.03 (0.023)
FDI Stock	2.10*** (0.505)	2.23*** (0.697)	2.89*** (0.887)	2.79*** (0.425)	2.09*** (0.546)	1.99*** (0.626)	2.30*** (0.684)	2.66*** (0.663)
Avg. Inflation	-0.00 (0.001)	-0.01 (0.006)	-0.02* (0.012)	-0.00 (0.001)	-0.00 (0.001)	-0.01 (0.007)	-0.01 (0.009)	-0.01 (0.006)
GDP per capita	-0.02 (0.073)	0.00 (0.110)	-0.07 (0.154)	0.04 (0.050)	-0.07 (0.089)	0.02 (0.100)	0.04 (0.094)	0.01 (0.117)
Qualitative Var.	0.20*** (0.063)	0.08 (0.098)	-0.03 (0.161)	0.50*** (0.092)	0.17* (0.092)	0.01 (0.007)	0.00 (0.005)	-0.01 (0.005)
Qualitative Var. dummy	-0.13*** (0.049)	-0.12* (0.064)	-0.08 (0.100)	-0.80*** (0.162)	-0.12*** (0.045)	-0.00* (0.002)	-0.01** (0.002)	-0.00 (0.004)
Constant	4.21*** (1.587)	4.37** (2.138)	4.44* (2.464)	5.22*** (1.284)	4.48** (1.791)	3.30 (2.401)	4.51** (2.060)	4.22* (2.169)
Sargan p-value	0.186	0.151	0.32	0.373	0.128	0.688	0.655	0.604
Observations	271	201	134	333	260	224	225	200

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Additionally, some variables which were not significant above appear to have greater explanatory power when their effects on advanced and emerging economies are allowed to differ. Improved infrastructure is weakly associated with more secondary sector FDI into emerging markets, but this effect is insignificant for advanced economies. This is a more intuitive result than laid out above: it is natural to expect that emerging markets, which have generally weaker infrastructure than advanced economies, would find infrastructure improvements would bring in more FDI, while advanced economies, where such improvements have largely already been made, would not find the same effect. This appears to be the case.

While the coefficients on the enrollment variables themselves are not significant, implying that the effect of higher enrollment at any level cannot be said to be clearly positive for emerging markets, the coefficient on the interaction terms is marginally significant and negative, implying that the point estimate of the impact on secondary sector FDI of school enrollment in advanced economies is slightly less than that of emerging markets. This is perhaps a weaker version of the infrastructure story: higher enrollment is broadly positive for emerging markets, though the effect is weak, but in any case, the effect is significantly less for advanced economies.

Table 10. Tertiary FDI and Qualitative Determinants-By Level of Development

Dependent Variable Explanatory Variables	1	2	3	Tertiary FDI as a share of GDP				
	Labor	Judicial	Legal	Fin. Depth	Infrastructure	Prim. Enroll.	Second. Enroll.	Tert. Enroll
Openness	49.19*** (10.845)	54.20*** (17.461)	105.05*** (22.432)	30.00*** (7.935)	54.16*** (13.160)	40.89*** (14.912)	67.86*** (17.392)	50.68*** (15.663)
REER	6.00*** (1.307)	6.03*** (2.077)	7.32*** (2.779)	2.70*** (1.015)	6.72*** (1.413)	5.83*** (1.988)	6.55*** (2.220)	3.67** (1.594)
GDP growth	0.09*** (0.033)	0.12** (0.055)	0.15** (0.067)	0.04 (0.025)	0.13*** (0.038)	0.10** (0.043)	0.15*** (0.054)	0.09* (0.046)
FDI Stock	3.61** (1.709)	-2.32 (3.002)	-1.46 (4.046)	4.13** (1.659)	2.12 (1.934)	2.40 (2.910)	-0.48 (3.031)	-1.00 (3.049)
Avg. Inflation	-0.00 (0.002)	-0.01 (0.021)	-0.03 (0.026)	-0.00 (0.001)	-0.00 (0.002)	-0.02 (0.019)	-0.04 (0.025)	-0.04** (0.016)
GDP per capita	-1.91*** (0.546)	-1.37* (0.823)	-2.19** (0.999)	-0.57 (0.383)	-2.07*** (0.585)	-2.21** (0.932)	-2.01** (1.011)	-0.79 (0.771)
Qualitative Var.	0.01 (0.246)	-0.07 (0.384)	0.78 (0.567)	-0.25 (0.750)	0.52* (0.287)	0.00 (0.035)	-0.05 (0.039)	-0.02 (0.036)
Qualitative Var. dummy	-0.82* (0.489)	1.11* (0.649)	-1.15 (0.892)	0.58 (1.454)	0.28 (0.514)	0.16 (0.110)	-0.01 (0.093)	0.03 (0.051)
Sargan p-value	0.180	0.373	0.01	0.239	0.444	0.391	0.495	0.028
Observations	246	176	110	307	234	165	166	163

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

For tertiary sector FDI, the results are different when emerging and developed economies are distinguished (Table 10). Only three qualitative variables retain significance – and only weakly - in these regressions: labor market flexibility, infrastructure quality, and judicial independence. Better infrastructure is linked with more tertiary FDI, with no significant difference between emerging markets and advanced economies. A more independent judiciary leads weakly to more FDI but only in advanced economies, while a counterintuitive result holds for labor market flexibility: more flexible labor markets are linked with less FDI in advanced economies⁵.

⁵ This pattern is clear from the data. Taking the average value of the labor market variable over time for each of the 10 advanced economies in the sample, the most restricted labor markets are those of the eurozone: France, Germany, Italy and Spain, and the most liberal, Canada, the United Kingdom, and the United States. Relative to GDP, Spain, France and Germany (but not Italy), experience relatively high inflows of tertiary FDI compared to the average among developed economies, while the USA and Canada (but not Britain), receive significantly less. The result may have to do with the United States and Canada, with their more liberal economies and deregulated services sectors, having a more competitive domestic market in services, and thus being home to more efficient companies than the eurozone. Those companies then might invest both in the United Kingdom and in the eurozone itself, while few eurozone economies would be able to compete in North America. The pattern does not apply in developing economies, where the result is weaker but intuitive: more flexible labor markets encourage more tertiary FDI.

V. CONCLUSION

The results above yield a number of insights about attracting foreign direct investment. Chief among these is the difference between determinants of FDI into different sectors. The results above suggest that primary sector FDI has no strong linkages to either macroeconomic stability, level of development, or institutional quality, though like other forms of FDI, clustering effects appear important, with larger stocks attracting greater additional inflows. This is intuitive, as FDI decisions in, for example, mining or petroleum are primarily determined by the location of those resources, with both equipment and labor easily transferable across borders. It implies, however, that using aggregated FDI flows is likely to result in biased results, given the statistical noise provided by primary sector FDI in overall flows.

It is also important, however, to distinguish between secondary and tertiary flows, which have different linkages to the macroeconomy and to institutional and other qualitative indicators. While both secondary and tertiary FDI appear to benefit from agglomeration or clustering effects, FDI in services appears to be much more strongly impacted by macroeconomic conditions than FDI in manufacturing. While a weaker real effective exchange rate appears to draw more manufacturing FDI into an economy, it can reduce the amount of tertiary FDI. Tertiary FDI flows are also higher in more rapidly growing economies, and those which are more open.

Similar differences between secondary and tertiary FDI obtain for the qualitative and institutional variables analyzed here. More flexible labor markets and deeper financial markets attract more secondary FDI, while better infrastructure and a more independent judiciary attract more tertiary FDI. Educational attainment appears to have little relationship to either type of FDI, though as this is only proxied here through enrollment figures, further work would be necessary to assess whether this is a firm conclusion or the result of inadequate data.

Summary of Qualitative Variables' Impact on FDI Inflows			
	Primary FDI	Secondary FDI	Tertiary FDI
Macroeconomic			
Openness	+
Real Exchange Rate	...	--	+
GDP Growth	+
FDI Stock	...	+	+
Average Inflation
GDP per capita	--
Qualitative/Institutional			
Labor Market Flexibility	...	+(dev); +(adv)	-(adv)
Judiciary Independence	...	-(adv)	+(adv)
Legal System Efficiency
Financial Depth	...	+(dev);-(adv)	+(adv)
Infrastructure Quality	...	+(dev); +(adv)	+(dev)
Primary Enrollment
Secondary Enrollment	...	-(adv)	...
Tertiary Enrollment

+ represents significantly positive, - represents significantly negative, 'dev' represents developing countries, and 'adv' represents advanced economies.

Another important issue is that even when controlling for per capita income, the determinants of FDI appear to be quite different for advanced and emerging economies. Secondary sector FDI flows are drawn to both advanced and emerging economies under similar macroeconomic circumstances. On the other hand, labor market flexibility and financial depth appear to matter far more for emerging economies than advanced ones. For tertiary FDI, the situation is the opposite. Macroeconomic conditions are more important for advanced economies than for emerging ones: a stronger exchange rate and lower average inflation appear to attract more tertiary FDI into advanced economies, but these effects appear weaker among emerging markets, at least the relatively stable and well run economies in this sample. And qualitative variables appear to have only minor differences in their effects on FDI in advanced economies and emerging markets, with judicial independence in the case of advanced economies an important exception.

Taken together, these results suggest that a focus by policymakers on prudent macroeconomic management (e.g., low inflation, strong growth and openness) will lead to more FDI, though at least within the relatively stable group of economies analyzed here, the effects are strongest for services FDI in advanced economies. An exception to this favorable conclusion is the role of exchange rate policy: while maintaining a weak exchange rate to

stimulate manufacturing exports can lead to higher secondary sector FDI, it will at the margins reduce the amount of tertiary FDI received by the host country.

The role of the qualitative and institutional is also important. Liberalizing labor markets and measures to increase financial deepening could attract more secondary FDI into emerging markets, though these effects are weaker among advanced economies. A more independent judiciary and better infrastructure appear to attract more services FDI to both types of economies.

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Appendix I: GMM Dynamic Modeling

This appendix elaborates the Generalized Method of Moment (GMM) dynamic model.

Consider the following regression equations:

$$y_{i,t} = \alpha + \lambda y_{i,t-1} + \mu_i + v_{i,t} \quad (1)$$

where $y_{i,t}$ is regressed on its lag, and time-invariant cross-sectional factor μ_i .

The first difference of equation (1) produces the following equation:

$$y_{i,t} - y_{i,t-1} = \lambda(y_{i,t-1} - y_{i,t-2}) + v_{i,t} - v_{i,t-1} \quad (2)$$

where the time-invariant cross-sectional factor is eliminated, while the term $v_{i,t} - v_{i,t-1}$ is correlated with the term $y_{i,t-1} - y_{i,t-2}$.

To address this, Arrelano and Bond (1991) developed an instrumental matrix as follows:

$$W_i = \begin{bmatrix} [y_{i1}] & & & & 0 \\ & [y_{i1}, y_{i2}] & & & \\ & & \ddots & & \\ 0 & & & & [y_{i1}, \dots, y_{iT-2}] \end{bmatrix}$$

and the generalized least square regression can be conducted by pre-multiplying W' with equation (2):

$$W' \Delta y = W' \Delta y_{-1} \lambda + W' \Delta v \quad (3)$$

The one-step consistent estimator of Arrelano and Bond (1991) then is

$$\hat{\lambda}_1 = [(\Delta y_{-1})' W (W' (I_N \otimes G) W)^{-1} W' (\Delta y_{-1})]^{-1} [(\Delta y_{-1})' W (W' (I_N \otimes G) W)^{-1} W' (\Delta y)] \quad (4)$$

$$\text{where } G = \begin{pmatrix} 2 & -1 & 0 & \dots & 0 & 0 \\ -1 & 2 & -1 & \dots & 0 & 0 \\ 0 & -1 & 2 & \dots & 0 & 0 \\ \vdots & \vdots & \vdots & \ddots & \vdots & \vdots \\ 0 & 0 & 0 & \dots & 2 & -1 \\ 0 & 0 & 0 & \dots & -1 & 2 \end{pmatrix}$$

Arellano and Bond also put forward a consistent 2-step generalized method of moments (GMM) estimator:

$$\hat{\lambda}_2 = [(\Delta y_{-1})' W V_N^{-1} W' (\Delta y_{-1})]^{-1} [(\Delta y_{-1})' W V_N^{-1} W' (\Delta y)] \quad (5)$$

where $V_N = \sum_{i=1}^N W_i' (\Delta v_i) (\Delta v_i)' W_i$.

Under the assumption that the error term is not serially correlated and the explanatory variables are weakly exogenous, the GMM dynamic panel estimators use the following moment conditions:

$$E[y_{i,t-s} \bullet (v_{i,t} - v_{i,t-1})] = 0 \text{ for } s \geq 2; t=3, \dots, T \quad (6)$$

The above estimate of the difference GMM dynamic model, however, could be subject to statistical shortcomings. In a small sample where some explanatory variables are persistent over time, lagged levels make weak instruments for the difference model regression.

Asymptotically, the variance of the coefficients would rise and coefficients could be biased. To address the weakness, Blundell and Bond (1998) developed the system GMM dynamic model. The model combines the regression of first differences and that of levels. The instruments for the differences regression are the same as above, while the instruments for levels regression are the lagged differences of the variables. The additional moment conditions of the regression of levels are:

$$E[(y_{i,t-s} - y_{i,t-s-1}) \bullet (\mu_i + v_{i,t})] = 0 \text{ for } s=1 \quad (7)$$

The model can be expanded to introduce additional explanatory variables. In that case, the instrument matrix W would also include the lagged levels (and differences, if the system GMM is adopted) of these variables, with the number of lags depending on whether the variables are predetermined or strictly exogenous.