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FDI, Productivity and Financial Development

Laura Alfaro[1], *Sebnem Kalemli-Ozcan*[2] *and Selin Sayek*[3]

[1]*Harvard Business School and NBER,* [2]*University of Houston and NBER, and* [3]*Bilkent University*

1. INTRODUCTION

MANY policy makers and academics contend that foreign direct investment (FDI) can have important positive effects on a host country's development.[1] In addition to the direct capital financing it supplies, FDI can be a source of valuable technology and know-how while fostering linkages with local firms, which can help jump-start an economy. Over the last decades, developed countries as well as developing ones have increasingly offered incentives to attract foreign firms to their economies.

Recently, the special merits of FDI and the incentives offered to foreign firms have begun to be questioned. Fuelling this debate is the fact that the empirical evidence for FDI generating positive effects for host countries is ambiguous at both micro and macro levels.[2] In a survey of the literature, Hanson (2001) argues that there is weak evidence that FDI generates positive spillovers for host

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[1] The vast literature on foreign direct investment and multinational corporations has been surveyed many times. See Blomström and Kokko (1998), Görg and Greenaway (2004), Lipsey (2002), Barba-Navaretti and Venables (2004), and Alfaro and Rodríguez (2004) for surveys of spillover channels and empirical findings. A multinational enterprise (MNE) is a firm that owns and controls production facilities or other income-generating assets in at least two countries. When a foreign investor begins a greenfield operation (i.e. constructs new production facilities) or acquires control of an existing local firm, that investment is regarded as a direct investment in the balance of payments statistics. An investment tends to be classified as direct if a foreign investor holds at least 10 per cent of a local firm's equity. This arbitrary threshold is meant to reflect the notion that large stockholders, even if they do not hold a majority stake, will have a strong say in a company's decisions and participate in and influence its management. Hence, to create, acquire or expand a foreign subsidiary, MNEs undertake FDI. In this paper, we often use the terms MNEs and FDI interchangeably.

[2] For example, whereas positive effects of FDI spillovers were reported as part of Caves' (1974) pioneering work in Australia and by Kokko (1994) in Mexico, Haddad and Harrison's (1993) findings in Morocco, and Aitken and Harrison's (1999) findings in Venezuela do not support the spillover hypothesis. See Alfaro et al. (2004) and Carkovic and Levine (2005) for evidence on elusive gains of FDI at the macro level.

countries. In a review of the micro-level analysis literature on spillovers from foreign to domestically owned firms, Görg and Greenaway (2004) conclude that the effects are mostly negative. Surveying the macro-level empirical research, Lipsey (2002) notes there is no consistent relation between the size of inward FDI stocks or flows and GDP or growth. He further argues that there is need for more research on different circumstances that obstruct or promote spillovers. Blomström and Kokko (2003) conclude from their review of the literature that spillovers are not automatic since local conditions have an important effect in influencing firms' adoption of foreign technologies and skills.

Among these local conditions, Alfaro et al. (2004) examine the intermediary role played by local financial institutions in channelling the contributions of FDI to economic growth.[3] In particular, we argued that the lack of development of local financial markets can limit the economy's ability to take advantage of potential FDI spillovers. In this paper, we investigate whether this effect operates through factor accumulation and/or improvements in total factor productivity (TFP). Given the recent findings in the growth literature that show the important role of TFP over factor endowments in explaining cross-country income differences, we think this investigation is an important step in the right direction. We find that capital accumulation, both physical and human, does not seem to be the main channel through which countries benefit from FDI. Instead, we find that countries with well-developed financial markets gain significantly from FDI via TFP improvements.

The importance of well-functioning financial institutions in economic development has been recognised and extensively discussed in the literature. Researchers have shown that well-functioning financial markets, by lowering the costs of conducting transactions, ensure capital is allocated to the projects that yield the highest returns and therefore enhance growth rates.[4] Furthermore, as McKinnon (1973) states, the development of capital markets is 'necessary and sufficient' to foster the 'adoption of best-practice technologies and learning by doing'. In other words, limited access to credit markets restricts entrepreneurial development. If entrepreneurship allows greater assimilation and adoption of best technological practices made available by FDI, then the absence of well-developed financial markets limits the potential positive FDI externalities.[5]

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[3] Durham (2004) and Hermes and Lensink (2003) provide further evidence that countries with a well-developed financial market gain significantly from FDI.

[4] See among others Goldsmith (1969), McKinnon (1973), Shaw (1973), Boyd and Prescott (1986), Greenwood and Jovanovic (1990), and King and Levine (1993a,b).

[5] Other ways include the need to borrow funds to take advantage of the new knowledge local firms need to alter everyday activities and, more generally, reorganise their structure, buy new machines, and hire new managers and skilled labour. Although some local firms might be able to finance new requirements with internal financing, the greater the technological-knowledge gap between their current practices and new technologies, the greater the need for external finance. In most cases, external finance is restricted to domestic sources. See Alfaro et al. (2004) for further details.

The empirical evidence on whether international capital mobility, via FDI or other forms, contributes to growth, however, is mixed. Surveying the literature, Kose et al. (2006) conclude that the macroeconomic literature does not seem to find a robust significant effect of financial integration on economic growth. However, this literature has found that institutions, especially financial development (threshold effects or more generally the 'absorptive capacities'), play an important role.[6] In this debate, FDI can play a primary role. That is, financial opening and the resulting inflows of FDI could lead to an increase in TFP via knowledge spillovers, technology transfers and the fostering of linkages with domestic firms, depending on the local conditions. Our analysis suggests that financial markets seem to play a particularly important role in terms of allowing countries to reap the benefits of direct inflows of foreign capital precisely via TFP gains.

The rest of the paper is organised as follows: an overview of the literature is provided in Section 2; data are defined in Section 3; empirical results are discussed in Section 4; and Section 5 concludes.

2. FOREIGN DIRECT INVESTMENT AND DEVELOPMENT: AN OVERVIEW OF RECENT FINDINGS

Owing to the technology and know-how embodied in FDI, alongside the sheer foreign capital, host economies are expected to potentially benefit from these investments through knowledge spillovers. These spillovers can occur through various channels such as technology transfers, introduction of new processes and managerial skills to the domestic market, where further productivity gains can be realised via backward and forward linkages between foreign and domestic firms. Alongside these technological improvements FDI can simply contribute to capital accumulation. The foreign capital injected into the host economy could contribute to physical capital formation, while employee training can contribute to skill development in the country. In other words, FDI can contribute to the development effort of a country via factor accumulation – physical and human capital – or via improvements in total factor productivity (TFP). However, the empirical evidence shows that neither of these benefits can be presumed.

In terms of capital accumulation, Graham and Krugman (1991), Kindleberger (1969) and Lipsey (2002) show that investors often fail to fully transfer capital upon taking control of a foreign company; instead, they tend to finance an

[6] See also Mendoza et al. (2007) and Aoki et al. (2007).

important share of their investment in the local market.[7] If foreign firms borrow heavily from local banks, instead of bringing scarce capital from abroad, they may exacerbate domestic firms' financing constraints by crowding them out of domestic capital markets.[8]

In terms of the relation between human capital accumulation and FDI, there is ample anecdotal evidence that multinational enterprises (MNEs) undertake substantial efforts in the education of local workers and that MNEs offer more training to technical workers and managers than do local firms.[9] In some cases, MNEs also enter into training cooperation with local institutions in the host economy. For example, Intel in Costa Rica and Shell-BP in Nigeria have made contributions to local universities; in Singapore, the Economic Development Board has collaborated with MNEs to establish and improve training centres.[10] However, in an empirical analysis of a panel of countries, te Velde and Xenogiani (2007) find that FDI enhances skill development (particularly secondary and tertiary enrolment) only in countries that are relatively well endowed with skills to start with.

Finally, in terms of the relation between FDI and productivity, the empirical literature shows mixed results.[11] For example, looking at plant-level data in Venezuela, Aitken and Harrison (1999) find that the net effect of FDI on productivity is quite small, where FDI raises productivity within plants that receive the investment while lowering that of domestically owned plants. National studies by

[7] The industrial organisation literature suggests that firms engage in FDI not because of differences in the cost of capital but because certain assets are worth more under foreign than local control. If lower cost of capital were the only advantage a foreign firm had over domestic firms, it would still remain unexplained why a foreign investor would endure the troubles of operating a firm in a different political, legal and cultural environment instead of simply making a portfolio investment.

[8] See discussion in Feldstein (2000). Harrison and McMillian (2003), for example, find that in the Ivory Coast, for the period 1974–87, borrowing by foreign firms aggravated domestic firms' credit constraints. In contrast, Harrison et al. (2004) find FDI inflows to be associated with a reduction in firms' financing constraints using data from Worldscope on 7,079 firms in 28 countries.

[9] See Fosfuri et al. (2001) and discussion in Alfaro and Rodríguez (2004).

[10] World Bank (1995), Spar (1998) and Larraín et al. (2000).

[11] The micro empirical literature finds ambiguous results for the effect of FDI on a firm's productivity. This literature comes in three waves. Starting with the pioneering work of Caves (1974), the first-generation papers focus on country case studies and industry-level cross-sectional studies. These studies find a positive correlation between the productivity of MNEs and average value added per worker of the domestic firms within the same sector. Most of the second-generation studies, which use firm-level panel data, find no effect of foreign presence or find negative productivity spillover effects from the MNEs to the developing country firms; see Aitken and Harrison (1999). The positive spillover effects are found only for developed countries. Haskel et al. (2002), for example, find positive spillovers from foreign to local firms in a panel dataset of firms in the UK; Gorg and Strobl (2002) find that foreign presence reduces exit and encourages entry by domestically owned firms in the high-tech sector in Ireland. Overall, although there is plenty of anecdotal evidence of technology transfers, the empirical evidence on knowledge spillovers suggests that these cases are not representative in a broader sample and that local conditions play a role in allowing for these transfers to materialise. See discussion in Moran (2007).

Borensztein et al. (1998) and Carkovic and Levine (2005), using cross-country growth regressions, also provide little evidence that FDI has an exogenous positive effect on economic growth. Empirical evidence at the micro level remains ambiguous generally, although consistently more pessimistic for developing countries. Görg and Greenaway (2004), reviewing the micro evidence on externalities from foreign-owned to domestically-owned firms and paying particular attention to panel studies, conclude that the effects are mostly negative.

Why has the evidence of FDI generating positive spillovers been elusive? At the macro level, the literature finds evidence not of an exogenous positive effect of FDI on economic growth, but of positive effects conditional on local conditions and policies, notably: the policy environment (Balasubramanayam et al., 1996); human capital (Borensztein et al., 1998); local financial markets (Alfaro et al., 2004, 2006); sector characteristics (Alfaro and Charlton, 2007); sectoral composition (Aykut and Sayek, 2007); and market structure (Alfaro et al., 2006). But are even these conditions enough? Can positive effects of FDI be induced by the right local conditions or, more generally, by the right economic environment? Through what mechanisms can FDI contribute to positive spillover effects? Many empirical studies have looked for the presence of externalities without trying to understand the mechanisms through which they might occur. Their focus has been on finding indirect evidence of externalities by looking for associations between, for example, increased presence of MNEs in a country or sector and productivity improvements in local firms or upstream sectors. Establishing the robustness of these findings and devising appropriate policy interventions to maximise FDI externalities necessitate investigation of these mechanisms.

Based on these negative results, a recent generation of studies argues that since multinationals would like to prevent information leakage to potential local competitors, but would benefit from knowledge spillovers to their local suppliers, FDI spillovers ought to be between different industries. Hence, one must look for vertical (inter-industry) externalities instead of horizontal (intra-industry) externalities. This means the externalities from FDI will manifest themselves through forward or backward linkages, i.e. contacts between domestic suppliers of intermediate inputs and their multinational clients in downstream sectors (backward linkage) or between foreign suppliers of intermediate inputs and their domestic clients in upstream sectors (forward linkage). Indeed, in recent years, a new group of papers has explored the existence of positive externalities from FDI towards local firms in upstream industries (suppliers) with more encouraging results. Papers by Javorcik (2004) and Blalock and Gertler (2008), exploring the extent of positive externalities from FDI to local firms in upstream industries (suppliers), have made an important contribution to the literature in this respect. Javorcik (2004) and Alfaro and Rodríguez (2004), for example, find evidence for the existence of linkages between domestic firms and MNEs in Lithuania and in Venezuela, Chile and Brazil, respectively.

In contrast to what has sometimes been implied in the empirical literature on FDI externalities, a positive backward linkage effect does not necessarily imply a positive externality from MNEs to suppliers (Alfaro and Rodríguez, 2004). In fact, such a positive linkage effect should lead to a positive externality from MNEs to other firms in the same industry (i.e. a positive horizontal externality).[12] That the empirical literature finds precisely the opposite, a negative or zero horizontal externality and a positive vertical externality, is puzzling.

Why do we not observe a positive externality from MNEs to other firms in the same industry? Quality of data, measurement errors in productivity, and endogeneity issues in the presence of multinationals are all possible answers. Another possible answer to this puzzle is that there might be some negative horizontal externality that offsets the positive effect MNEs might otherwise have on other firms in the same industry consequent on increases in the variety (or even quality) of domestic inputs precipitated by, for example, the competition effect occasioned by the entry of MNEs (as argued by Aitken and Harrison, 1999), or MNEs' pirating of the best workers from domestic firms.[13] But as mentioned, another is that not all countries may enjoy the 'preconditions' to take advantage of potential benefits from FDI.[14] More generally, as mentioned, several recent FDI studies have investigated how national characteristics might affect host countries' capacity to benefit from FDI, the so-called absorptive capacities. These studies postulate that the size of spillovers from foreign firms depends on the domestic firms' ability to respond successfully to new entrants, new technology and new competition. The domestic

[12] An obvious follow-up question is whether all vertical linkage relations imply positive FDI spillovers, and what is the nature of these spillovers. The cherry-picking behaviour of many foreign firms with respect to local firms that can already supply goods (Javorcik and Spatareanu, 2005) is not necessarily associated with potential positive externalities. That foreign firms seem also to help some suppliers improve their performance again implies an externality only if these benefits are not fully internalised by the firm. Surveys administered to suppliers and MNEs in Costa Rica revealed few cases in which there had clearly been a positive technology transfer from an MNE to suppliers (see Alfaro and Rodríguez, 2004). The interviews also revealed that MNEs often lack technical knowledge about the production processes of the inputs they use. When they do have such knowledge, it tends to be about production processes for sophisticated inputs that, because they are unlikely to be supplied by local firms, are usually sourced from highly specialised international suppliers. Instead of examples of knowledge spillovers via technology transfers, the interviews revealed many instances in which local firms had decided to upgrade the quality of their production processes in order to become MNE suppliers.

[13] An important challenge for the literature is to control for competition effects. Data availability imposes a significant restriction on efforts to address this issue through econometric work, particularly in developing countries. In some recent work, Alfaro et al. (2006) combine theory and a calibration approach to formalise the mechanism through which the trickle-down effect of FDI via backward linkages depends on the extent of local conditions: market structure, financial markets, competition for skilled and unskilled labour and other local conditions and quantify the properties of the model for realistic parameters.

[14] Javorcik and Spatareanu's (2007) study shows that less liquidity constrained firms become MNE suppliers – underscoring the importance of well-developed financial markets for allowing firms to fully reap the benefits associated with FDI inflows.

firms' success is, to some extent, determined by local characteristics such as the domestic level of human capital and the overall institutional level of the country. Weaknesses in these areas may reduce the capacity of domestic industries to absorb new technologies and to respond to the challenges and opportunities presented by foreign entrants. Variation in absorptive capacities between countries (and industries within countries) is a promising line of research because it offers a potentially appealing synthesis of the conflicting results that have emerged from the literature. We have stressed the role of financial markets, and in what follows we explore the role its development plays in enhancing the relation between FDI flows and economic growth, via investment or TFP.[15]

3. DATA

The Appendix describes in detail the data used in the empirical analysis. In this section, data for the three most significant variables are discussed: the measures of foreign direct investment, financial market development and total factor productivity (TFP) growth rate.

An important source for the FDI data is the IMF publication 'International Financial Statistics' (IFS), which reports the balance of payments statistics on FDI. The net FDI inflows reported in the IFS measure the net inflows of investment to acquire a lasting management interest (10 per cent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. The gross FDI figures reflect the sum of the absolute values of inflows, excluding the possible outflow of previous foreign investments. Our model focuses on the inflows to the economy; therefore, we prefer to use the net inflow measure. Alternative data sources include UNCTAD and OECD publications; however, the IMF data allow a more comprehensive analysis by availability of data for a larger set of countries.

[15] Alfaro et al. (2006) formalise the mechanism through which FDI leads to a higher growth rate in the host country via backward linkages. This result is consistent with the micro evidence found by recent studies that argue that, since multinationals would like to prevent information leakage to potential local competitors, but would benefit from knowledge spillovers to their local suppliers, FDI spillovers ought to be between different industries. Hence, one must look for vertical (inter-industry) externalities instead of horizontal (intra-industry) externalities. This means the externalities from FDI will manifest themselves through forward or backward linkages, i.e. contacts between domestic suppliers of intermediate inputs and their multinational clients in downstream sectors (backward linkage) or between foreign suppliers of intermediate inputs and their domestic clients in upstream sectors (forward linkage). These results are consistent with FDI spillovers between different industries. The mechanism in Alfaro et al. (2006) depends on the extent of the development of the local financial sector. Financial markets act as a channel for the linkage effect to be realised and create positive spillovers. This channel is also consistent with the macro literature cited above that shows the importance of absorptive capacities.

Following King and Levine (1993a,b), Levine and Zervos (1998) and Levine et al. (2000), we construct several financial market series, including the share of liquid liabilities in the overall economic activity level, a measure reflecting the asset structure of the banking sector and the share of private sector credit in GDP. We draw on variables introduced by Levine et al. (2000), which in turn build on King and Levine (1993a). The data associated with the former are available from the World Bank Financial Structure Database. Specifically, three variables are included in our work.[16] First, Liquid Liabilities of the Financial System (henceforth, *LLY*) equal currency plus demand and interest-bearing liabilities of banks and non-financial intermediaries divided by GDP. It is the broadest measure of financial intermediation and includes three types of financial institutions: the central bank, deposit money banks, and other financial institutions. Hence, *LLY* provides a measure for the overall size of the financial sector without distinguishing between different financial institutions. Second, Commercial–Central Bank Assets (henceforth, *BTOT*) equals the ratio of commercial bank assets divided by commercial bank plus central bank assets. *BTOT* measures the degree to which commercial banks rather than the central bank allocate society's savings. King and Levine (1993a) and Levine et al. (2000), as well as others, have used this measure, which provides a relative size indicator, i.e. the importance of the different financial institutions and sectors relative to each other. Third, Bank Credit (henceforth, *BANKCR*) equals credits by deposit money banks to the private sector as a share of GDP (it does not include non-bank credits to the private sector). The two previous measures do not differentiate between the end users of the claims of financial intermediaries, i.e. whether the claims are in the public or the private sector.[17] The number of countries for which we have these financial market variables and FDI shares is 72.

While the first set of regressions aim at identifying the relationship between growth, financial markets and FDI, we further investigate the channels of such growth effects. The issue of whether FDI affects growth through the total factor productivity or factor accumulation, and the role financial markets play in channelling these effects, requires the use of TFP growth rates as a dependent variable. The TFP growth rate data are obtained from Bernanke and Gurkaynak (2001), where the latest data are available for the period 1975–95. As such, although the remaining data are available for a longer time period, we limit the analysis to cover the period for which the TFP data are available.[18] The coverage

[16] The URL for the database is http://siteresources.worldbank.org/INT_RES/Resources/469232–1107449512766/FinStructure6006final.xls.

[17] While the analysis is replicated using all four alternative financial market measures, we only report those using the credit-related indicators of financial market depth for which we have data for a higher number of countries.

[18] The URL for the latest data from Bernanke and Gurkaynak (2001) is http://www.bilkent.edu.tr/refet/research.html.

TABLE 1
Summary Descriptive Statistics

Variable	*Mean*	*Standard Deviation*	*Minimum*	*Maximum*
Sample 1: 72 countries (1975–95)				
Growth rate	0.01	0.02	–0.04	0.07
FDI/GDP	0.01	0.01	–0.00	0.04
LLY/GD	–0.89	0.55	–1.86	0.48
BTOT	–0.30	0.31	–1.30	–0.01
BANKCR	–1.32	0.73	–3.39	0.32
PRIVO	–1.10	0.79	–3.39	0.50
Investment/GDP	0.23	0.06	0.11	0.41
Sample 2: 62 countries (1975–95)				
TFP growth rate	0.00	0.01	–0.04	0.02
FDI/GDP	0.01	0.01	0.00	0.04
LLY/GDP	–0.89	0.53	–1.86	0.48
BTOT	–0.25	0.24	–1.30	–0.01
BANKCR	–1.28	0.70	–3.39	0.32
PRIVO	–1.03	0.75	–3.39	0.50
Investment/GDP	0.23	0.05	0.12	0.38

Notes:
Data descriptions are provided in the Appendix and data section. Note, the financial market indicators are logged, as they are used in this transformation in the relevant regressions. Sample 1 refers to the countries used in the regressions where the growth rate or the investment/GDP ratio are the dependent variable, while sample 2 refers to the countries used in the regressions where the TFP growth rate is the dependent variable. See the Appendix for a detailed description of the variables.

of the TFP data allows the inclusion of 62 countries in the regressions where TFP is the dependent variable. These countries are listed in the Appendix. The TFP measure used in the regressions uses the imputations from Bernanke and Gurkaynak (2001) where the labour share is assumed constant at 65 per cent across all countries. We prefer this measure to the alternative where the actual labour share is used for each country given the reduced sample size available with this alternative measure. Bernanke and Gurkaynak (2001) provide TFP calculations for two alternative assumptions regarding the return to education, respectively 0 per cent and 7 per cent. The analysis is conducted for both measures; however, given the similarity in results, we report only those for the TFP calculated using a constant share of labour across countries and 7 per cent return to education.

Table 1 presents descriptive statistics for investment, growth and financial development data, as well as the TFP growth rate data. There is considerable variation in the share of FDI in GDP across countries, ranging from −0.15 per cent in Sierra Leone to 4 per cent in Malaysia. GDP growth also shows variation, ranging from −4 per cent for Guyana to 7 per cent for Korea. The financial development variables also range extensively: the log of liquid liabilities as a share of GDP ranges from −1.86 per cent for Peru to 0.48 per cent for Japan, the

TABLE 2
Correlations among Selected Variables

	Productivity	*Growth*	*Investment*	*FDI*	*PRIVO*	*BANKCR*	*Schooling*	*Institutions*
Productivity	1.00	...	...	...	...	...	...	...
Growth	0.84	1.00	...	...	...	...	...	...
Investment	0.17	0.47	1.00	...	...	...	...	...
FDI	0.02	0.14	0.02	1.00	...	...	...	...
PRIVO	0.34	0.39	0.26	0.08	1.00	...	...	...
BANKCR	0.31	0.36	0.19	0.08	0.94	1.00	...	...
Schooling	0.37	0.40	0.08	0.10	0.60	0.52	1.00	...
Institutions	0.51	0.46	0.16	0.18	0.77	0.73	0.69	*1.00*

log of private credit by deposit banks as a share of GDP ranges from −3.39 per cent for Ghana to 0.50 per cent for Switzerland. Finally, the TFP growth rate ranges from −4 per cent for Nicaragua to 3 per cent for Thailand. Table 2 shows the correlations among the selected variables.

4. EMPIRICAL ANALYSIS

The purpose of our empirical analysis is to examine whether the financial markets channel through which FDI is beneficial for growth operates through factor accumulation or TFP. We will adopt a simple OLS cross-country strategy to establish the basic patterns in the data. The pros and cons of this strategy will be discussed in the next section. As a first step, we assess whether the level of financial development in the host country affects the relationship between FDI and growth. Then, we ask whether the effects of FDI are through factor accumulation – both physical and human capital – or via TFP. The importance of well-functioning financial institutions in augmenting technological innovation, capital accumulation and economic development has been recognised and extensively discussed in the literature.[19] By lowering the costs of conducting transactions, well-functioning financial markets ensure capital is allocated to the projects that yield the highest returns and therefore enhance growth rates. There are several plausible reasons to expect that financial markets might complement the spillover effects of FDI. First, the successful acquisition of new technologies introduced by foreign firms will generally involve a process of reorganisation and reinvestment by their domestic competitors. To the extent that this process is externally financed from domestic sources, efficient financial markets will enhance the competitive response of the domestic industry. Well-developed financial markets also enable

[19] See King and Levine (1993a,b) and Beck et al. (2000).

TABLE 3
Economic Growth, FDI and Financial Markets (1975–95)

	1	*2* *PRIVO*	*3* *BANKCR*	*4* *PRIVO*	*5* *BANKCR*
Initial GDP	–0.012	–0.012	–0.012	–0.012	–0.012
	[3.88]***	[3.86]***	[3.87]***	[3.77]***	[3.81]***
FDI/GDP	–0.06	–0.06	–0.06	–0.26	–0.27
	[0.22]	[0.21]	[0.19]	[1.09]	[1.11]
Human capital	0.01	0.01	0.01	0.01	0.01
	[2.62]**	[2.49]**	[2.62]**	[2.15]**	[2.49]**
Institutional quality	0.005	0.005	0.005	0.005	0.005
	[2.61]**	[2.46]**	[2.53]**	[2.47]**	[2.46]**
Financial market	...	0.003	0.002	0.006	0.005
	...	[0.55]	[0.43]	[1.27]	[1.20]
(*FDI/GDP*) * Financial market	...	...	...	0.78	0.89
	...	...	...	[2.72]***	[2.91]***
Constant	0.06	0.06	0.06	0.07	0.07
	[2.06]**	[2.09]**	[2.08]**	[2.36]**	[2.41]**
Controls	Yes	Yes	Yes	Yes	Yes
Observations	72	72	72	72	72
R^2	0.60	0.60	0.60	0.64	0.64

Notes:
Dependent variable is average growth rate of real GDP per capita. Robust *t*-statistics are in brackets. * Significant at 10%; ** significant at 5%; *** significant at 1%. Financial market depth is measured by private credit extended by deposit banks as a share of GDP in columns 2 and 4, while in columns 3 and 5, it is measured as the share of private credit by the whole financial system as a share of GDP. Controls include a subset of population growth rate, black market premium, inflation, trade, government consumption and Sub-Saharan Africa dummy in each column.

other domestic firms and entrepreneurs to capitalise on linkages with new multinationals (see Alfaro et al., 2006).

In a cross-country analysis, Alfaro et al. (2004) find that countries with well-developed financial markets benefit significantly more from FDI than countries with weaker markets. The authors find no direct effect of FDI on growth, but they find consistently significant results when FDI is combined in an interaction term with a range of measures of financial development. Before we explore the channels through which these effects take place, we first re-establish our results for the whole sample, whose time period is limited by TFP data.

Regressions in Table 3 examine the role of FDI on growth through financial markets. We interact FDI with financial markets and use this as a regressor. To ensure that the interaction term does not proxy for FDI or the level of development of financial markets, both of the latter variables were also independently included in the regression. Thus, we run the following regression:[20]

[20] Note that the variables in the interaction term are demeaned to avoid conflicting interpretations.

$$GROWTH_i = \alpha + \beta_1(FDI/GDP_i) + \beta_2(FINANCE_i) + \beta_3(FDI/GDP_i * FINANCE_i) + \mathbf{X}_i'\gamma + \varepsilon_i, \quad (1)$$

where **X** stands for the vector of control variables that include initial income, human capital, population growth, government consumption, institutional quality and sub-Saharan Africa, inflation and trade. Results of the most basic regression are provided in column (1) of Table 3.[21] In columns (2) and (3), we add financial market indicators, in (2) private credit extended by deposit banks and (3) share of private credit by the whole of the financial system.[22] In columns (2) and (3), we present results with no interaction term. As seen in the table, FDI is not significant in columns (1) to (3). These results summarise the findings in the literature: FDI does not exert a robust positive impact on growth. This ambiguous effect of FDI and the role of local conditions has been the motivation for this ongoing research.

In columns (4) and (5) of Table 3, we include the interaction term which turns out to be positive and significant at 1 per cent for the different financial sector variables. To get an estimate of how important the financial sector has been in enhancing the growth effects of FDI, one can ask the hypothetical question of how much a one standard deviation increase in the financial development variable would enhance the growth rate of a country receiving the mean level of FDI in the sample.[23] If we use the private credit variable (i.e. column (4)), it turns out that having better financial markets would have allowed countries to experience an annual growth rate increase of 0.64 percentage points.

Table 4 presents results for an expanded set of controls that include domestic investment and interactions with institutions, respectively. The strong positive correlation between the domestic investment ratio and the growth rate of an economy is one of the few consistent results to have emerged from the multitude of cross-country growth regressions that have appeared in the past decade. One could argue that the reason FDI appears significant in the above analysis is because the domestic investment ratio was not controlled for (albeit FDI is a small component of total investment for most countries in the sample). Therefore, for further robustness checks, we add domestic investment to the list of independent variables. The results are reported in columns (1)–(4) of Table 4. As expected, domestic investment enters significantly in all the regressions, but our results remain robust. We present results using the share of private credit by the whole financial system as a share of GDP for the sake of brevity, but similar results are obtained with other measures. Another concern is that our financial market

[21] See the data section for detailed definitions.
[22] We also used stock market development, obtaining similar results.
[23] The mean value for FDI is 1.003 per cent in the 72-country sample. Note that the financial development variable here is the log of the financial market indicator.

TABLE 4
Economic Growth, FDI and Financial Markets (1975–95): Other Interactions and Investment

	1	*2*	*3*	*4*	*5*
Initial GDP	–0.01	–0.01	–0.01	–0.01	–0.01
	[3.76]***	[3.57]***	[4.50]***	[3.74]***	[3.95]***
FDI/GDP	–0.07	–0.32	–0.17	–0.28	–0.24
	[0.23]	[1.37]	[0.60]	[1.06]	[1.02]
Human capital	0.01	0.01	0.01	0.01	0.01
	[2.36]**	[1.98]*	[2.30]**	[2.12]**	[2.29]**
Investment	0.08	0.09	0.09	0.09	0.09
	[2.33]**	[3.42]***	[2.39]**	[2.38]**	[2.55]**
Institutions (*Inst.*)	0.005	0.005	0.007	0.006	0.006
	[2.64]**	[2.64]**	[3.62]***	[3.36]***	[3.51]***
Financial market (*FMD*)	0.000	0.003	0.003	0.007	0.006
	[0.07]	[0.95]	[0.83]	[1.73]*	[1.58]
(*FDI/GDP*) * *FMD*	...	1.08	...	1.04	1.23
	...	[3.60]***	...	[2.36]**	[3.27]***
(*FDI/GDP*) * *Inst.*	...	...	0.24	–0.04	...
	...	...	[1.41]	[0.22]	...
(*FDI/GDP*) * *HK*	...	...	...	...	–0.42
	...	...	...	...	[1.41]
Constant	0.03	0.04	0.07	0.07	0.02
	[1.07]	[1.22]	[2.34]**	[2.00]*	[0.71]
Controls	Yes	Yes	Yes	Yes	Yes
Observations	72	72	72	72	72
R^2	0.64	0.70	0.62	0.65	0.65

Notes:
Dependent variable is average growth rate of real GDP per capita. Robust *t*-statistics in brackets. * Significant at 10%; ** significant at 5%; *** significant at 1%. Financial market depth is measured by the *BANKCR* indicators in all columns. Controls include a subset of population growth rate, black market premium, inflation, trade, government consumption and Sub-Saharan Africa dummy in each column.

variable may be proxying for the overall institutional quality level of the country. Columns (3) and (4) show our results to be robust to controlling for institutional quality and the interaction of FDI with institutional quality. Repeating the above hypothetical example, results in Table 4 suggest that a one standard deviation increase in the financial development variable would enhance the growth rate of a country receiving the mean level of FDI in the sample by approximately 0.8 percentage points over a 20-year period.

The macro literature has emphasised the dependence of productivity spillovers on the absorptive capacity of the local economy, with specific reference to human capital, financial development and openness. The importance of human capital presumably relates to the ability of a highly skilled domestic workforce to adopt advanced technology. If the transfer of new technology and skills is one of the beneficial effects of FDI, we might expect the relationship between industry growth rate and FDI's levels to be stronger in industries that are highly skill dependent.

In Table 4, we look at the interaction of FDI with human capital since this term is shown to have a significant positive effect on economic growth in earlier research.[24] Column (5) reports the main results. While FDI and schooling both register significant effects, the interaction between the two does not. Contrary to previous findings, the interaction term is not significant. However, we are using a different human capital variable for a slightly different time period, and therefore our result may not be comparable with previous findings. The interaction between FDI and financial markets remains robust.

a. Factors or TFP?

In Table 5, we present results of the following regression:

$$INV_i = \alpha + \beta_1(FDI/GDP_i) + \beta_2(FINANCE_i) + \beta_3(FDI/GDP_i * FINANCE_i) + \mathbf{X}_i'\gamma + \varepsilon_i, \quad (2)$$

where INV_i corresponds to the ratio of domestic investment to GDP, and the rest of the variables are as before.

Column (1) considers the role of financial market development using private credit by deposit banks as the measure. The variable has a positive and significant effect on capital accumulation. FDI does not have a significant effect. We consider the interaction term in column (2), in which it appears not to be significant. In columns (3) and (4), we consider private credit to the whole financial system which also appears not to be significant. FDI is not significant either. Similar results are obtained when we consider the role of human capital in columns (5) and (6). Our results hold when considering the role of overall institutional development as seen in columns (7) and (8).[25] The main lesson from these regressions is that if FDI has an effect on growth, it does not seem to operate via capital accumulation even when we consider threshold and interaction effects with the absorptive capacities of the economy.

In an effort to further study FDI's role in inducing additional factor accumulation in the host country, we further study the above equation using human capital as the dependent variable. Therefore, the following regression is run:

$$HK_i = \alpha + \beta_1(FDI/GDP_i) + \beta_2(FINANCE_i) + \beta_3(FDI/GDP_i * FINANCE_i) + \mathbf{X}_i'\gamma + \varepsilon_i. \quad (3)$$

[24] See Borensztein et al. (1998) and Xu (2000).

[25] In terms of the interaction between FDI and proxies for institutional quality (bureaucratic quality), the negative and significant effect is consistent with findings by Gorodnichenko et al. (2006) for a sample of emerging markets.

TABLE 5
Domestic Investment, FDI and Financial Markets (1975–95)

	Dependent Variable: Domestic Investment, 1975–95							
	PRIVO		*BANKCR*					
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Initial GDP	–0.02	–0.02	–0.02	–0.02	–0.02	–0.02	–0.01	–0.01
	[1.69]*	[1.72]*	[1.50]	[1.53]	[1.64]	[1.66]	[1.16]	[1.08]
FDI/GDP	0.08	0.49	0.13	0.59	0.18	0.44	0.62	0.56
	[0.08]	[0.44]	[0.13]	[0.51]	[0.16]	[0.38]	[0.58]	[0.53]
Human capital	0.02	0.02	0.03	0.03	0.02	0.02	0.02	0.02
	[1.08]	[1.15]	[1.47]	[1.49]	[1.26]	[1.23]	[1.15]	[1.12]
Institutional quality	0.000	0.000	0.002	0.002	0.001	0.003	–0.001	–0.002
	[0.05]	[0.03]	[0.25]	[0.31]	[0.13]	[0.37]	[0.17]	[0.23]
FMD	0.04	0.03	0.02	0.01	0.02	0.02	0.02	0.03
	[2.19]**	[1.64]	[1.14]	[0.72]	[1.67]	[1.00]	[1.77]*	[1.92]*
(*FDI/GDP*) * *FMD*	...	–1.59	...	–1.96	...	–2.40	...	0.58
	...	[1.19]	...	[1.19]	...	[1.07]	...	[0.46]
(*FDI/GDP*) * *HK*	...	...	...	...	–0.36	0.90	...	...
	...	...	...	...	[0.30]	[0.51]	...	...
(*FDI/GDP*) * *Inst.*	...	...	...	...	...	...	–1.10	–1.25
	...	...	...	...	...	...	[1.91]*	[1.95]*
Constant	0.38	0.37	0.34	0.32	0.35	0.33	0.30	0.30
	[2.72]***	[2.98]***	[2.37]**	[2.66]**	[2.26]**	[2.62]**	[2.94]***	[2.85]***
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	72	72	72	72	72	72	72	72
R^2	0.27	0.29	0.22	0.25	0.22	0.24	0.28	0.28

Notes:
Robust *t*-statistics in brackets. * Significant at 10%; ** significant at 5%; *** significant at 1%. Financial market depth is measured by private credit extended by deposit banks as a share of GDP in columns 2 and 3, while in the remaining columns it is measured as the share of private credit by the whole financial system as a share of GDP. Controls include a subset of population growth rate, black market premium, inflation, trade, government consumption and Sub-Saharan Africa dummy in each column.

Results reported in Table 6 suggest that, similar to its effect on physical capital, FDI plays no significant role in inducing human capital accumulation either. This result holds regardless of the alternative absorptive capacities that are tested for, including the depth of local financial markets and institutional quality.

Finally, Table 7 considers similar analysis using TFP growth as dependent variable. In particular we run,

$$TFPgrowth_i = \alpha + \beta_1(FDI/GDP_i) + \beta_2(FINANCE_i) + \beta_3(FDI/GDP_i * FINANCE_i) + \mathbf{X}_i'\gamma + \varepsilon_i, \quad (4)$$

where $TFPgrowth_i$ corresponds to the growth rate of the TFP calculated using a constant labour share, imputations following Bernanke and Gurkaynak (2001). Columns (1) and (2) show FDI not to have an exogenous effect on TFP. However, we obtain positive and significant results once we consider the interaction of FDI with the level of development of the financial market. This result holds for both alternative measures of financial market development, i.e. when we use private credit by deposit banks, in column (2), and private credit by the whole financial system, in column (4). Once again, a hypothetical exercise of imputing the TFP growth effects of a one standard deviation improvement in the financial market indicator for a country receiving the mean level of FDI suggests the TFP growth rate will increase by approximately 0.50 percentage points over a 20-year period. In column (5), we obtain that the result is robust to considering human capital interactions; in column (6), we show the same for the case of the interaction with institutional development. These results are consistent with the mechanism advanced in Alfaro et al. (2006). In a theoretical framework, the authors formalise the mechanism through which FDI leads to a higher growth rate in the host country via backward linkages, which is consistent with the micro evidence. The mechanism depends on the extent of the development of the local financial sector. Financial markets act as a channel for the linkage effect to be realised and create positive spillovers. The model is a small open economy where final goods production is carried out by foreign and domestic firms, which compete for skilled labour, unskilled labour and intermediate products. To operate a firm in the intermediate goods sector, entrepreneurs must develop a new variety of intermediate good, a task that requires upfront capital investments. The more developed the local financial markets, the easier it is for credit-constrained entrepreneurs to start their own firms. The increase in the number of varieties of intermediate goods leads to positive spillovers to the final goods sector. As a result, financial markets allow the backward linkages between foreign and domestic firms to turn into FDI spillovers. These spillovers imply positive efficiency effects.

TABLE 6
Human Capital, FDI and Financial Markets (1975–95)

	Dependent Variable: Human Capital, 1975–95							
	PRIVO		*BANKCR*					
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Initial GDP	0.24	0.24	0.26	0.27	0.27	0.27	0.28	0.28
	[3.51]***	[3.55]***	[3.66]***	[3.70]***	[3.79]***	[3.79]***	[3.84]***	[3.75]***
FDI/GDP	–4.85	–6.46	–3.91	–5.24	–5.00	–5.81	–4.02	–4.99
	[0.76]	[0.85]	[0.61]	[0.70]	[0.77]	[0.77]	[0.62]	[0.66]
Institutions	0.00	0.00	0.00	0.00	0.01	0.01	0.03	0.02
	[0.07]	[0.08]	[0.07]	[0.03]	[0.24]	[0.22]	[0.44]	[0.35]
FMD	0.17	0.19	0.13	0.15	0.06	0.07	0.02	0.05
	[1.63]	[1.63]	[1.29]	[1.39]	[0.62]	[0.66]	[0.27]	[0.47]
(*FDI/GDP*) ∗ *FMD*	...	6.39	...	10.46	...	3.52	...	9.10
	...	[0.70]	...	[0.75]	...	[0.37]	...	[0.54]
(*FDI/GDP*) ∗ *Inst.*	...	...	–0.92	–3.64	...	...	–1.29	–3.67
	...	...	[0.30]	[0.67]	...	...	[0.43]	[0.61]
Constant	–0.22	–0.17	–0.46	–0.52	–0.45	–0.42	–0.52	–0.58
	[0.27]	[0.20]	[0.57]	[0.64]	[0.58]	[0.53]	[0.63]	[0.68]
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	72	72	72	72	72	72	72	72
R^2	0.76	0.76	0.74	0.75	0.75	0.75	0.74	0.74

Notes:
Robust *t*-statistics in brackets. * Significant at 10%; ** significant at 5%; *** significant at 1%. Financial market depth is measured by private credit extended by deposit banks as a share of GDP in columns 2 and 3, while in the remaining columns it is measured as the share of private credit by the whole financial system as a share of GDP. Controls include a subset of population growth rate, black market premium, inflation, trade, government consumption and Sub-Saharan Africa dummy in each column.

TABLE 7
Total Factor Productivity (TFP), FDI and Financial Markets (1975–95)

	Dependent Variable: TFP Growth Rate, 1975–95					
	PRIVO		*BANKCR*			
	1	*2*	*3*	*4*	*5*	*6*
Initial GDP	–0.01	–0.01	–0.01	–0.01	–0.01	–0.01
	[3.11]***	[2.65]**	[3.31]***	[2.97]***	[3.15]***	[3.07]***
FDI/GDP	–0.28	–0.51	–0.28	–0.52	–0.41	–0.34
	[1.24]	[3.08]***	[1.23]	[2.79]***	[2.19]**	[1.82]*
Human capital	0.006	0.003	0.005	0.003	0.004	0.004
	[1.65]	[1.20]	[1.47]	[0.96]	[1.06]	[1.15]
Institutional quality	0.005	0.004	0.005	0.004	0.005	0.005
	[3.83]***	[3.52]***	[3.88]***	[2.89]***	[4.41]***	[3.96]***
Financial markets	–0.004	–0.002	–0.005	–0.002	0.000	0.000
	[1.09]	[0.56]	[1.26]	[0.79]	[0.11]	[0.11]
*FDI/GDP * FMD*	...	0.73	...	0.83	0.74	1.07
	...	[2.91]***	...	[2.76]***	[2.22]**	[3.56]***
*FDI/GDP * HK*	...	...	...	...	–0.17	...
	...	...	...	...	[0.73]	...
*FDI/GDP * Inst.*	...	...	...	...	...	–0.27
	...	...	...	...	...	[2.42]**
Constant	0.02	0.02	0.03	0.03	0.02	0.06
	[1.01]	[0.97]	[1.37]	[1.28]	[0.72]	[2.56]**
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	62	62	62	62	62	62
R^2	0.51	0.58	0.52	0.58	0.49	0.52

Notes:
Robust *t*-statistics in brackets. * Significant at 10%; ** significant at 5%; *** significant at 1%. Financial market depth is measured by private credit extended by deposit banks as a share of GDP in columns 1 and 2, while in the remaining columns it is measured as the share of private credit by the whole financial system per GDP. Controls include a subset of population growth rate, black market premium, inflation, trade, government consumption and Sub-Saharan Africa dummy in each column.

b. Discussion on Identification

We are well aware that the correlations we have shown so far are the 'proximate determinants' of output growth, TFP growth, and factors as opposed to 'causal' determinants.[26] An important concern in the FDI–growth literature is that growth may itself spawn more FDI. Alternatively, some third variable might affect a country's growth trajectory and, thereby, its attractiveness to foreign capital. In these cases, the coefficients on the estimates are likely to overstate the positive impact of foreign investment. Both theoretically and empirically, it is plausible, and also very likely, that both the magnitude of FDI and the efficiency of financial markets increase with higher growth rates. This is a tough issue to deal with and almost impossible to resolve without good instruments.

We prefer to adopt a less ambitious strategy and show a falsification exercise in Table 8. We switch the places of our independent and dependent variables and regress FDI on growth. It is clear that there is no significant relationship of growth on FDI. This shows that as a first cut reverse causality may not be of major concern for our sample. As far as omitted variables go, we did utilise a wide range of controls and hence we worry less about this issue.

At the micro level, other researchers did find causal but indirect effects. Javorcik and Spatareanu (2007) find that Czech firms supplying multinationals tend to be less liquidity constrained than other firms. The relationship and causality between facing financing constraints and supplying MNEs may go both ways. If firms need some investment in order to become suppliers to MNEs, then the causality goes from better development financial markets to allowing MNEs' benefits to materialise. However, it is also possible, as the authors note, that receiving a contract from an MNE improves the creditworthiness of suppliers, allowing them to obtain outside lending. The authors find, however, after a careful examination of the timing of the phenomenon, that this result is the result of the self-selection of less liquidity-constrained firms into supplying relationships. This evidence further suggests that in the absence of well-functioning financial markets, local firms may find it difficult to start business relations with MNEs and reap benefits of productivity spillovers. This mechanism is consistent with the formalisation in Alfaro et al. (2006), and the empirical evidence revealed in this paper that benefits seem to go via TFP and not capital accumulation. Hoxa et al. (2007) use micro-estimates of FDI on firm-level productivity and growth accounting and find that the efficiency effect FDI can account for approximately 12 per cent of total variation in log of GDP per capita across countries in the 1990s. Alfaro and Charlton (2007) provide industry-level evidence by using data for OECD countries at the industry level and show that the relation between FDI at the industry level and growth is

[26] Prasad et al. (2007), also focusing on correlations, find that in countries with weaker financial systems, foreign capital does not contribute to the growth of financially dependent industries.

TABLE 8
Falsification: FDI, Growth and Factor Accumulation (1975–95)

	Dependent Variable: FDI as a Share of GDP, 1975–95								
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
Growth rate	0.01	–0.02	–0.03	–0.02	–0.02	0.09	...	0.11	...
	[0.08]	[0.18]	[0.26]	[0.23]	[0.23]	[0.63]	...	[0.81]	...
Schooling	0.0002	0.0000	0.0003	–0.0019	–0.0018	–0.0026	...	...	–0.0029
	[0.07]	[0.01]	[0.11]	[0.73]	[0.71]	[1.14]	...	...	[1.50]
SSA dummy	–0.01	–0.01	–0.01	–0.01	–0.01	–0.01	–0.01	–0.01	–0.01
	[2.33]**	[2.48]**	[2.46]**	[3.14]***	[3.24]***	[2.58]**	[3.49]***	[2.07]**	[4.24]***
Institutions	0.001	0.001	0.001	0.001	0.001	0.003	0.002	0.002	0.003
	[0.92]	[0.69]	[0.64]	[0.55]	[0.69]	[2.29]**	[2.17]**	[2.23]**	[2.64]**
Trade	...	...	...	0.01	0.01	0.01	0.01	0.01	0.01
	...	...	...	[4.87]***	[4.40]***	[3.05]***	[3.32]***	[3.03]***	[3.36]***
Financial markets	...	...	...	...	–0.001	–0.002	–0.002	–0.002	–0.002
	...	...	...	...	[0.61]	[0.84]	[0.78]	[0.86]	[0.76]
Productivity	...	...	...	...	...	–0.27	–0.16	–0.29	–0.15
	...	...	...	...	...	[1.37]	[1.26]	[1.38]	[1.22]
Constant	0.03	0.04	0.04	0.01	0.01	0.00	–0.01	–0.01	–0.01
	[1.43]	[1.56]	[1.55]	[0.81]	[0.78]	[0.23]	[0.77]	[0.55]	[0.55]
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Set 1	Set 2	Set 3	Set 4	Set 4	Set 4	Set 5	Set 5	Set 5
Observations	72	72	72	72	72	62	62	62	62
R^2	0.18	0.19	0.19	0.40	0.41	0.41	0.38	0.39	0.40

Notes:
Set 1 of control variables includes initial GDP, population growth rate and government spending. Set 2 adds the black market premium to set 1, set 3 adds inflation to set 2, set 4 adds investment to set 3, and finally set 5 excludes initial GDP from set 4. Robust statistics are reported in brackets. * Significant at 10%; ** significant at 5%; *** significant at 1%.

stronger for industries more reliant on external finance. These results, apart from being consistent with the existing macro literature and hypothesised benefits of FDI, are further evidence of important cross-industry differences in the effects of FDI.

5. CONCLUSIONS

In this paper, we examined the effect of FDI on growth via financial markets by investigating whether this effect operates through factor accumulation and/or improvements in TFP. Factor accumulation – physical and human capital – does not seem to be the main channel through which countries benefit from FDI. Instead, we find that countries with well-developed financial markets gain significantly from FDI via TFP improvements. These results are consistent with the recent findings in the growth literature that show the important role of TFP over factors in explaining cross-country income differences. The caveat is that our results are interpretable as the 'proximate determinants' of output growth, TFP growth, and factors as opposed to 'causal' determinants. We undertake a simple falsification exercise to show that reverse causality is not a major concern for our sample.

What are some sensible policy implications from the research to date? FDI can play an important role in economic growth, most likely via enhancement of efficiency rather than by capital accumulation, but local conditions matter and can limit the extent to which FDI benefits materialise. It is not clear that incentives to MNEs are warranted. More prudent policies might involve eliminating barriers that prevent local firms from establishing adequate linkages, improving local firms' access to inputs, technology and financing, and streamlining the procedures associated with selling inputs. But we might also seek to improve domestic conditions, which should have the dual effect of attracting foreign investment (Alfaro et al., 2008) and enabling host economies to maximise the benefits of such foreign investment.

APPENDIX

a. Countries in the Samples

1. Sample of 72 countries for which data on credit markets are available (*BANKCR*, *BTOT*, *PRIVCR*, *LLY*).
2. Sample of 62 countries for which data on TFP growth rates are available.

b. List of Countries

Algeria (1,2), Argentina (1,2), Australia (1,2), Austria (1,2), Belgium (1,2), Bolivia (1), Brazil (1,2), Cameroon (1,2), Canada (1,2), Chile (1,2), Colombia

(1,2), Congo (1,2), Costa Rica (1,2), Cyprus (1), Denmark (1,2), Dominican Republic (1,2), Ecuador (1,2), Egypt (1,2), El Salvador (1,2), Finland (1,2), France (1,2), Gambia (1), Germany (1), Ghana (1,2), Greece (1,2), Guatemala (1,2), Guyana (1), Haiti (1), Honduras (1,2), India (1,2), Indonesia (1,2), Iran (1), Ireland (1,2), Israel (1,2), Italy (1,2), Jamaica (1,2), Japan (1,2), Kenya (1,2), Korea (1,2), Malta (1), Malawi (1,2), Malaysia (1,2), Mexico (1,2), Netherlands (1,2), New Zealand (1,2), Nicaragua (1,2), Niger (1,2), Norway (1,2), Pakistan (1,2), Panama (1,2), Papua New Guinea (1,2), Paraguay (1,2), Peru (1,2), Philippines (1,2), Portugal (1,2), Senegal (1,2), Sierra Leone (1), South Africa (1,2), Spain (1,2), Sri Lanka (1,2), Sudan (1), Sweden (1,2), Switzerland (1,2), Syria (1,2), Thailand (1,2), Togo (1,2), Trinidad & Tobago (1,2), United Kingdom (1,2), United States (1,2), Uruguay (1,2), Venezuela (1,2), Zimbabwe (1,2).

c. Data Sources and Descriptions

Foreign direct investment: The net FDI inflows measure the net inflows of investment to acquire a lasting management interest (10 per cent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital and short-term capital as shown in the balance of payments. Source: IMF International Financial Statistics.

Output levels and growth: Output level and growth data is the growth of real per capita GDP, constant dollars. Source: World Development Indicators (WDI), World Bank (2000).

TFP growth rate: Growth in total factor productivity from Bernanke and Gurkaynak (2001).

Liquidity (LLY): Liquid liabilities of the financial system (currency plus demand and interest-bearing liabilities of the financial intermediaries and non-bank financial intermediaries) divided by GDP. Source: World Bank Financial Structure Database.

Private credit (PRIVCR): The value of credits by financial intermediaries to the private sector divided by GDP. It excludes credit issued by central and development banks. Furthermore, it excludes credit to the public sector and cross-claims of one group of intermediaries on another. Source: World Bank Financial Structure Database.

Bank credit (BANKCR): Credit by deposit money banks to the private sector as a share of GDP. Source: World Bank Financial Structure Database.

Commercial–central bank (BTOT): Ratio of commercial bank domestic assets divided by central bank plus commercial bank domestic assets. Source: World Bank Financial Structure Database.

Domestic investment: 'Gross domestic investment' measuring the outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. Source: World Bank (2000).

Inflation: Percentage changes in the GDP deflator. Source: World Bank (2000).

Government consumption: Total expenditure of the central government as a share of GDP. It includes both current and capital (development) expenditures and excludes lending minus repayments. Source: World Bank (2000).

Trade volume: Exports plus imports as a share of GDP. Source: World Bank (2000).

Schooling: Human capital measured as the average years of secondary schooling in total population. Source: Barro and Lee (1996). Updated version downloadable from: http://www.cid.harvard.edu/ciddata/ciddata.html.

Bureaucratic quality: The institutional strength of the economy. High levels of quality imply that the bureaucracy has the strength and expertise to govern without drastic changes in policy, or interruption to public services. Source: International Country Risk Guide (ICRG).

Risk of expropriation: The probability that the government may expropriate private property. Source: ICRG.

Black market premium: This is calculated as the premium in the parallel exchange market relative to the official market (i.e. the formula is (parallel exchange rate/official exchange rate − 1) ∗ 100). The values for industrial countries are added as zero. Source: World Bank (http://www.worldbank.org/research/growth/GDNdata.htm).

Real effective exchange rate: Calculated as the ratio of local price index to the multiplication of the US price index and the official exchange rate. Source: World Bank (http://www.worldbank.org/research/growth/GDNdata.htm).

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