AID AND FOREIGN DIRECT INVESTMENT:
International Evidence

M. Ugur Karakaplan[1], Bilin Neyapti[2] and Selin Sayek[3]

Bilkent University

Abstract:

Although the literature on the effects of both aid and foreign direct investment (FDI) on development is vast (eg. Burnside and Dollar, 1997, Dollar and Easterly, 1999, Easterly, 2003), the relationship between aid and FDI has not been sufficiently explored. This paper empirically investigates the effect of aid on foreign direct investment in view of the hypothesis that countries that receive aid also become more likely to receive FDI. We further claim, however, that this happens especially in cases of good governance and financial market development, and not necessarily otherwise.

To test these hypotheses we employ a panel analysis and control for the factors besides aid that are likely to encourage or discourage the FDI flows, such as stability indicators, openness and the income level. The preliminary findings appear to provide robust empirical support for our hypothesis.

Key terms: Foreign aid, FDI
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[1] Graduate student at Bilkent University, e-mail: mugur@bilkent edu.tr
[2] Corresponding author, Associate Professor, Bilkent University, Dept. of Economics, 06800 Bilkent, Ankara-Turkey. Tel: (90 312) 290 2030, Fax: (90 312) 266 5140. e-mail: neyapti@bilkent.edu.tr
[3] Assistant Professor, Bilkent University, e-mail: neyapti@bilkent.edu.tr

I.   Introduction

There is renewed interest among policymakers and many donor governments to increase their role in official development assistance. Despite the internationally agreed rate of official assistance (0.7% of their respective GDP) many of the donor countries remain far below this level. Notwithstanding this, aid has been and remains to be a significant portion of the GDP of many developing and less developed countries. Given the significant role of aid flows for the recipient economies and the renewed interest among donors, the effects of aid flows — more importantly the effectiveness of aid flows — has therefore been at the center of the development agenda.

The effects of aid flows on economic growth, private investment, government revenue and quality of institutions, among several other aspects, have been widely discussed in the literature.[4] The following study examines a different but related issue: Does official development assistance create sufficient positive direct and indirect (signaling) effects in the recipient economy to attract more foreign direct investment (FDI) to the aid recipient economy? While the relationship between FDI and aid has also been alluded to a lot in the literature, the literature falls short of offering a satisfactory account of the empirical linkage between these variables.

The question has relevance from several different perspectives. Firstly, the relationship between aid flows and foreign direct investment flows underlies the major issue of aid effectiveness. The empirical evidence regarding the growth or private investment benefits of aid flows has been ambiguous. Several studies have found that official development

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[4] An overview of several variables' relationship with aid is provided in White (1992), including the relationship between aid and growth, aid and the real exchange rate, and aid and savings. Other papers are discussed in the literature review section of this paper. Buliř and Hamann (2001) discuss the effects of aid flows on the fiscal discipline of the recipient country, while Lensink (1993) and Pillai (1982) show evidence regarding the negative effects of aid flows on government revenue. Stotsky and Wolde Mariam (1997) argue the contrary, showing that aid flows increase the revenue effort of the recipient economy. Knack (2001) and Alesina and Weder (2002) study the link between the quality of bureaucracy and aid flows, and the possible incentives created for.

assistance does not necessarily improve economic conditions in the recipient country, and sometimes may even worsen the conditions. [5] In fact many studies suggest that the effectiveness of official assistance depends on the existence of necessary local conditions, ranging from "good" macroeconomic policies, deep local financial markets, and negative external shocks, to "good" geography.[6]

Secondly, from a balance of payments accounting perspective, the question can be interpreted as whether or not the official financing is eventually replaced by private financing. Rephrasing this statement, one could ask whether or not aid recipient countries graduate from aid-dependency and are able to finance their BOP from the private markets. The expectation is that the aid-recipient countries, with effective use of the official development assistance and having mostly implemented first-generation reforms and second-generation reforms, will be able to attract significant levels of FDI which will eventually replace aid flows. If private capital flows can replace aid flows in financing development then one can argue that the loans were successful in creating an enabling environment to the private sector, and the need for repetitive official assistance disappears over time.[7]

Thirdly, recently several studies have looked into the effects of aid flows on the institutional quality of the recipient economy. Knack (2001), Alesina and Weder (2002), among others, have shown that aid flows could create governance issues. This is mostly due to the nature of the capital flows, as aid flows generate a lot of rent they could increase the rent seeking activities and dead weight losses. If so, then intermediating the same magnitude

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[5] Evrensel (2002) studies the effectiveness of IMF lending programs, interpreting the findings of the study as suggesting the ineffectiveness of the programs in improving economic conditions in the borrowing economy. Burhop (2004) finds that the causal impact of aid on growth and investment differs across countries, without a notable connection with good economic policy.

[6] Burnside and Dollar (???) discuss the role of good macroeconomic policies. Nkusu and Sayek (2004) discuss the role of local financial market development in allowing better management of official development assistance. Dalgaard, Hansen, and Tarp (2002) and Guillamont and Chauvet (2001) discuss the role of geography and external shocks, respectively.

[7] Easterly, 2005, shows that the structural lending packages are currently very repetitive.

of flows through the private sector might be preferred, as the markets might impose managerial control more effectively compared to management of official assistance.

Fourthly, recently the official development assistance loans have increasingly become more comprehensive to include private sector related issues, especially focusing on private sector enabling reforms. Knack (2001) reports that, according to a World Bank study (reference), projects funded by the World Bank increasingly include components of public sector reforms in areas such as civil service, legal, and judicial systems, public expenditure management, anticorruption, and fiscal transparency. Building administrative capacity has become a significant part of loans recently. Supporting evidence is reflected in the lending patterns of the World Bank; lending in support of public sector institutional reforms has nearly doubled from 1997 to 1999, increasing from US$4 billion to US$ 7.5 billion. Furthermore, over the same period, the share of approved projects that include public expenditure and financial reform components have increased from 9 % to 28%, and the share of those that include anticorruption or fiscal transparency components have increased from 8% in 1998 to 50% in 2000. Given this emphasis of using the official development assistance as a vehicle to create a private sector enabling environment the question of whether or not aid flows induce significantly more foreign direct investment inflows becomes a very important and relevant question.

Along these lines, this paper investigates the relationship between FDI and aid. Our main hypothesis is that aid leads FDI only in cases of good governance and financial market development and not necessarily otherwise. We argue that the presence of foreign assistance in a country is not sufficient condition to attract FDI and hence the lack of a direct relationship between the two variables should not be unexpected. As noted above, this is

along the lines of the discussion regarding the necessity of good macroeconomic policies and deep financial markets for the effective use of aid flows, in generating economic growth.[8]

Using unbalanced panel data on 197 countries over the period of 1960-2004, we investigate the causal effect of Aid on FDI using moving averages of data with the consideration that investment decision do not depend on year to year observations, but, rather, a stock of information on the economic performance of a country. The findings of the current paper provide empirical evidence strongly in support of our hypotheses: both good governance and financial market development significantly improves the impact of aid on subsequent flows of FDI.

The rest of the paper is organized as follows: Section II discusses the relevant literature. In section III, the data and methodology are discussed, Section IV presents the empirical results, and Section V concludes.

II. Literature Review

Given the increased volume of FDI flows over the past decade and the belief of potential benefits of FDI on growth and development, understanding the factors that affect the FDI flows has gained importance and hence have been studied extensively in the literature.[9] In this study we will limit our review of the literature with the macroeconomic studies of the determinants of FDI flows, and will not go into the micro-level studies.[10] While there is no consensus on a final list of factors that are most important in influencing FDI flows, there is consensus regarding the direction of effect for many of the variables studied. Among the

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[8] See footnote 3.
[9] Many studies have found that FDI could potentially have positive effects on economic growth; however, the extent of effect depends on several conditions that could be categorized as "the absorptive capacity" of the local economy. The absorptive capacity includes the human capital (see Borenzstein, de Gregario and Lee,1998), the trade policy of the local economy (Balasubramanyam et al, 1996), and financial market depth (Alfaro, Chanda, Kalemli-Ozcan, and Sayek, 2004), among others.
[10] For a more detailed literature review see Caves (1996) for the earlier studies and Blonigen (2005) for more recent studies.

variables that have been shown to influence FDI flows is the market size, the openness to trade of the recipient economy, the exchange rate, taxes and tariffs, among many other variables. Despite the very extensive list of the variables discussed as possible determinants of FDI, aid flows is rarely mentioned as a factor that affects FDI. This paper fills this void in the literature.

As discussed in Singh and Jun (1995) the FDI literature deals with three specific questions: the reasons national companies become multinationals, the reasons underlying the choice of the operation mode in the foreign country (exporting, licensing, versus international production), and reasons for FDI flows across countries. These questions could be discussed through the eclectic paradigm put forward by Dunning (1993), namely the ownership-location-internalization (OLI) paradigm. This paradigm is built around four conditions: the level of ownership-specific (O) advantages, the level of market internalization (I) advantages, the extent of location-specific (L) advantages and the extent of foreign production. The third question put forward by Singh and Jun (1995) is the focus of this study, and the location (L) pillar of the OLI paradigm is the most appropriate means for this discussion. Among the various location (L) factors are the distribution of resource endowments and markets, input prices, quality and productivity, transport and communication cost, investment incentives, barriers to trade, social and infrastructural provisions, cross-country differences and system of government.

Calvo et al. (1996), in studying the evolution of capital flows to developing countries, classifies the factors that influence FDI flows as "push" or "pull" factors. The "push" factors are those that are external to the recipients of FDI, while the "pull" factors are those internal to them. A similar classification is presented by Tsai (1991), Ning and Reed (1995) and Lall et al. (2003), classifying the factors as those on the supply-side and those on the demand-side. The current study will focus on the latter group of factors, namely the economic and social

variables that capture the demands-side (pull) factors. The pull factors include interest rates, tax and tariff levels, market size and potential, quality of institutions, wage rates, human capital, cost differentials, exchange rates, fiscal policies, trade policies, physical and cultural distance, and state of infrastructure among others.

Root and Ahmed (1977), Nigh (1986), Ning and Reed (1995), and Love and Lage-Hidago (2000), among many others, find that MNFs, either in search to exploit scale economies or strong markets for the sale of their final products, prefer to invest in economies with larger market size and market potential. The market size and potential are measured as the GDP, GDP per capita, or GDP growth. Contrary to these numerous studies that find the market size or potential to positively influence the location choice of MNFs Bollen and Jones (1982) and Filippaios et al. (2003) find that the relationship could well be negative under different estimation methods and datasets.

The exchange rate is shown to be an important factor in influencing the relative wealth of MNFs, and through this relative wealth effect an important factor that affects the FDI flows. FDI is shown to increase (decrease) with depreciation (appreciation) of host country's currency. Froot and Stein (1992) show that the relative wealth effects of the exchange rate changes are due to imperfections in the capital markets, whereas Blonigen (1997) shows that this effect is due to imperfections in the goods markets. The predictions of these two models are supported by the empirical findings of Grubert and Mutti (1991), Swenson (1994), Kogut and Chang (1996), with limited evidence that the effect is larger for merger and acquisition FDI (see, e.g., Klein and Rosengren, 1994).

Trade policies effect FDI flows via quotas, tariffs or other barriers to trade. Host country's degree of openness to trade, measured as either the de jure measures of trade policies or de factor measures of the extent of trade as a share of GDP, is a priori thought to be a positive determinant of FDI decisions in the literature. Deichman (2001), Janicki and

Wunnava (2004), Caetano et al (2004) support this a priori expectation that trade and FDI are complements. By contrast, Filippaios et al. (2003) finds out that ratio of exports to external trade is a negative determinant of US FDI, which they interpret as suggesting that the MNFs invest to serve the local market rather than export its internationally produced goods.

The education level in the host country reflects not only the investment in the human capital and skills but also the availability of professional services that could be demanded by the MNFs. In a cross-country study, Lall et al (2003) show the positive relation between the human capital and FDI inflows. Deichman et al. (2003) find supporting evidence at the regional level, using student per teacher ratio to capture the quality of education.

Studies have shown that besides the above-mentioned economic dimensions political stability and quality of institutions could possibly play an important role in the decisions of MNFs. Instability and bad governance are factors that discourage FDI inflows, as such instability and low quality of institutions act as taxes and additional costs to investment decisions. Lall et al (2003) measure political stability using the political right's index proposed by Gastil (1984-1994) and find supporting evidence. Singh and Jun (1995), using the political risk index developed by Business Environment Risk Intelligence, find a positive relation between FDI and stability. Smarzynska and Wei (2001) use two measures of corruption indices and prove negative effect of corruption on FDI decisions. Janicki and Wunnava (2004), and Brada et al (2004) find that healthy investment environments by means of macroeconomic and political stability are favored by MNFs. On the contrary, Bollen and Jones (1982) reports weak effects of political instability on FDI, measuring political instability as including events of political assassinations, coups, armed attacks, and deaths from domestic violence. Moreover, Albuquerque et al (2004) find that the relationship between the strength of property rights, absence of corruption and quality of governance have no significant effect on FDI inflows.

Besides political instability, the MNFs are also concerned about macroeconomic stability, which can be proxied by the inflation rate in the local economy. Sayek (2004) shows that inflation in the host country leads to "consumption-smoothing" behavior of MNFs, who shift their production decision between the home and the host country.

Recent empirical studies on FDI also suggest that agglomeration effects provide valuable information to the new investors. One proxy for such agglomeration effects is the lagged FDI inflows, which include the previous investments by MNFs. The persistent behavior of FDI is well-documented by Wheeler and Mody (1992), Singh and Jun (1995), and Maskusen and Markus (2002), among others.

The availability of professional and business services in the host country could also be thought of as measures of agglomeration effects. Among such business services one can think of the depth of financial markets. Though the MNFs would mostly use their retained earnings for investment decisions they would still benefit from the development of local financial markets in carrying out their daily operations. Albuquerque et al (2004), measuring the financial depth as the ratio of private credit by deposit banks and other financial institutions to GDP, find further supporting evidence regarding the positive effects of agglomeration effects on FDI.

Despite this very rich list of variables that have been identified as factors influencing the FDI decisions of MNFs, the role of aid flows in this process is discussed in a very limited fashion. Only in Root and Ahmed (1977) is per capita foreign aid is mentioned as a potential determinant of FDI, with no significant relationship reported. In a micro-data study, Blaise (2005) shows that, Japanese official assistance to the People's Republic of China (RPC) has a significant promoting effect on FDI.

Though the effects of aid on FDI have not been explicitly studied in the literature, there is an extensive literature studying the effects of official development assistance (ODA) on

economic growth, and much more limited literature studying the relationship between domestic investment and ODA. The studies on the effects of ODA on growth have found that the growth effects of aid depend on the local economic conditions and policies of the aid recipient economy. Among these studies Burnside and Dollar(2000) finds that aid only generates economic growth if the recipient government implements "good" macroeconomic policies. These good policies include a budget surplus, openness to trade and low inflation. Several studies have recently challenged these findings, showing that when the estimation period and dataset are altered the results change significantly (see Easterly, Levine, Roodman, 2003 and Burnside and Dollar, 2004)). Other studies have found that conditions besides good macroeconomic policies are also important in allowing for the effective use and management of aid flows, including depth of local financial markets (Nkusu and Sayek, 2004), and external shocks (Guillamont Chauvet, 2001, Collier and Dehn, 2001),

In an attempt to explain the constraint on the economic growth of Africa, Dollar and Easterly (1999) find that there is no robust effect of aid on domestic investment, and no robust effect of domestic investment on economic growth. These findings, they suggest, imply that aid does not cause much growth effects in Africa. Collier and Dehn (2004) study a similar issue for a wider range of countries, finding that aid does spur private investment.

III. Data and Methodology

In this study, our main hypothesis is that aid gives rise to FDI flows in countries where good governance and developed financial markets exist, and not necessarily otherwise. To test the main hypothesis of this study, we consider that the essential feature of the estimation is to capture a causal effect of aid on FDI. Since investment is irreversible, past information usually involves a stock of economic performance rather than year to year fluctuations due to

variety of reasons. Hence, our estimation of FDI involves the moving average observations of the right hand side variables including the lagged moving average of FDI itself.

In order to test the hypothesis that aid causes FDI under only favorable investment environment and not otherwise, we also need to control for other variables that possibly affect FDI. Among them, we consider economic stability, which can be measured by the level and variability in inflation; level of development, which can be measured roughly by per capita GDP or human capital; real exchange rates, as a measure of competitiveness; openness and; business cycles, commonly accounted for by the growth of GDP. In view of these, we propose the following model.

$$
\begin{aligned}
sFDI_{it} = {} & \alpha_{0i} + \alpha_1 (MA3\, sODA)_{it} + \alpha_2 (MA3\, sFDI)_{i(t-1)} \\
& + \alpha_3 (MA3 \ln GDPpc)_{it} + \alpha_4 (MA3\, D)_{it} + \alpha_5 (\sigma5\, D)_{it} \\
& + \alpha_6 (MA3 \ln REER)_{it} + \alpha_7 (MA3\, open)_{it} \\
& + \alpha_8 (MA3\, grGDP)_{it}
\end{aligned}
\tag{1}
$$

where sFDI stands for the share of FDI in GDP; all MA3 terms indicate moving averages over the past 3 years; sODA is the share of Overseas Development Agency records of Aid; lnGDPpc is the logarithm of per capita GDP in US dollars[11]; D is the loss in the real value of money a la Cukierman et al.(1992)[12]; $\sigma5D$ is the variation in D over the past 5 years[13]; ln REER is the logarithm of real effective exchange rate; open is the measure of openness calculated as the share of trade in GDP; and finally, grGDP is the growth in real GDP. The sources and detailed definitions of all the variables are provided in Appendix 1.

Considering that our main hypothesis involves exploring the effects of governance (gov) and financial market development (FMD) on the relationship between aid and FDI, we modify the model (1) by introducing interactive terms of both FDI and ODA with gov and

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[11] Alternative to ln GDPpc, we also use a specification of the model where we use human capital development (HK), proxied by secondary school attendance. We mention the results of the estimation of this alternative specification later in the paper.
[12] D = inflation rate /(1+ inflation rate) is used to reduce the variability in inflation across the data as the transformation restricts the measurement between 0 and 1.
[13] We considered that 5 years is a more appropriate period over which one looks at variability, even though we considered 3 years as sufficient for averaging other observations.

FMD. Gov indices are measured with 6 different variables a la Kaufmann et al. (2003)[14], namely: political stability and absence of violence (polins), rule of law (rule), control of corruption (contcorr), government effectiveness (goveff), regulatory quality (requal), and voice and accountability (voacc). We measure FMD by three different indices: the share of M2 in GDP (sM2); the share of deposit money banks claims in GDP (sCR); and the share in GDP of deposit money banks claims on private sector (sCRpr). We form indices for all of the gov and FMD variables in such away that the highest number gets the value of 1 and the lowest is 0. Hence, its via estimating models (2) and (3) below that we test the main hypotheses of this paper.

$$
\begin{aligned}
sFDI_{it} = {} & \alpha_{0i} + \alpha_1 (MA3\,sODA)_{it} + \alpha_2 (MA3\,sODA \times Gov)_{it} \\
& + \alpha_3 (MA3\,sFDI)_{i(t-1)} + \alpha_4 (MA3\,sFDI \times Gov)_{i(t-1)} \\
& + \alpha_5 (MA3\ln GDPpc)_{it} + \alpha_6 (MA3\ln GDPpc \times Afr)_{it} \qquad (2) \\
& + \alpha_7 (MA3\,D)_{it} + \alpha_8 (\sigma 5D)_{it} + \alpha_9 (MA3\ln REER)_{it} \\
& + \alpha_{10} (MA3\,open)_{it} + \alpha_{11} (MA3\,grGDP)_{it}
\end{aligned}
$$

$$
\begin{aligned}
sFDI_{it} = {} & \alpha_{0i} + \alpha_1 (MA3\,sODA)_{it} + \alpha_2 (MA3\,sODA \times FMD)_{it} \\
& + \alpha_3 (MA3\,sFDI)_{i(t-1)} + \alpha_4 (MA3\,sFDI \times FMD)_{i(t-1)} \\
& + \alpha_5 (MA3\ln GDPpc)_{it} + \alpha_6 (MA3\ln GDPpc \times Afr)_{it} \qquad (3) \\
& + \alpha_7 (MA3\,D)_{it} + \alpha_8 (\sigma 5D)_{it} + \alpha_9 (MA3\ln REER)_{it} \\
& + \alpha_{10} (MA3\,open)_{it} + \alpha_{11} (MA3\,grGDP)_{it}
\end{aligned}
$$

Models (2) and (3) employ interactions of both ODA and FDI terms with gov and FMD terms, respectively. For each alternative definition of gov and FMD, we estimate the models separately, which results in 9 different estimations (6 for gov and 3 for FMD indicators) that will be reported below.

Our panel data set covers 97 countries over the period of 1960 to 2004, where available. The set of countries is simply selected based on data availability. Furthermore, due to various length of time series availability for the countries, the data is unbalanced. We note

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[14] Each of the gov variables combine numerous measures of governance and the original governance scores lie between -2.5 and 2.5 where higher scores in each index mean better governance. The measures are available for 1996, 1998, 2000 and 2002. For each, we take averages over these years.

that the possible existence of fixed effects lead to inconsistency in OLS estimation (see, Nickell, 1981). While first differencing eliminates fixed effects, this also imposes possible serial correlation in the error terms, assuming that the original data has no serial correlation. Following Arellano and Bond (1988), we employ the estimation technique that overcomes these problems by utilizing GMM instruments to estimate a dynamic unbalanced panel data (DPD).

We thus proceed with our estimation by using the variables described above in their first differenced form. The GMM instruments are chosen to be the further lags of the dependent variable (sFDI) than the ones included among the right hand side (RHS) variables and the remaining RHS variables. The specification tests are provided under each table, including the tests for instrument validity (Sargan test); and that for the lack of second order serial correlation (m2 statistic). We also provide Wald statistics for the joint significance of the various combination of variables, in addition to the overall set of RHS variables.

IV. Empirical Results

The estimation of our basic model (1) is performed with GMM technique that selects instrumental variables for the unbalanced panel data set as the further lags of the dependent variables and the remainder of the control variables. Tables 1 thru 3 reports the results of the estimations of models (1) to (3).

The results of the estimation of our basic model are reported in Table 1, where we alternatively use GDPpc and HK as measures of the level of development, besides the rest of the control variables. In column 1, we observe that ODA, lagged FDI, HK, openness and growth are positive and significant, as expected. Also consistent with expectations, inflation (D), inflation variability and REER all exhibit negative significance, where the coefficient of REER indicates the effect of losing competitiveness. As read from the bottom of the table,

the estimation also passes the tests of Sargan for instrument validity, and m2 for the lack of second order serial correlation.

Table 1: Estimation of Model (1). Dependent Variable: $sFDI_t$

Explanatory variables:	I	II	III
$(MA3sODA)_t$	-0.05*** (-10.30)	-0.05*** (-17.70)	-0.06*** (-16.40)
$(MA3sFDI)_{t-1}$	0.39*** (66.30)	0.18*** (142.00)	0.16*** (85.50)
$(MA3HK)_t$		-0.002*** (-6.77)	0.01*** (17.60)
$(MA3lnGDPpc)_t$	0.01*** (13.60)		
$(MA3lnGDPpc \times Afr)_t$			-0.02*** (-38.40)
$(MA3D)_t$	-0.02*** (-17.60)	-0.02*** (-18.80)	-0.02*** (-15.00)
$(\sigma 5D)_t$	-0.02*** (-10.50)	0.01*** (4.29)	0.0003 (-0.18)
$(MA3lnREER)_t$	-0.01*** (-19.60)	-0.002*** (-13.50)	-0.003*** (-10.90)
$(MA3open)_t$	0.02*** (34.20)	0.02*** (42.30)	0.02*** (28.10)
$(MA3grGDP)_t$	0.06*** (8.25)	0.08*** (31.50)	0.08*** (64.50)
Constant	0.0001*** (2.34)	0.001*** (68.40)	0.001*** (44.70)
No. of Observations	1013	1320	1320
Wald (Joint)	64620 [0.00]	66930 [0.00]	63560 [0.00]
Wald (Dummy)	5.47 [0.02]	4683 [0.00]	2001 [0.00]
Wald (MA3lnGDPpc terms)			1630 [0.00]
Sargan test	64.98 [1.00]	85.09 [1.00]	89.06 [1.00]
m_2 test	0.21 [0.83]	-0.88 [0.38]	-0.88 [0.38]

Note: Numbers in parentheses are the t-ratios; numbers in brackets are the probabilities; *** indicates significance at 1% level.

Virtually the same results are observed by using GDPpc instead of HL (reported in column 2), except that GDPpc itself appears negative and significant.   We deal with this unintuitive finding in the following way. After carefully inspecting the data, we observe that

it is mainly the African countries that possibly derive this result. We therefore employ a dummy variable for African countries (Afr) in order to differentiate the response of FDI to the level of income. Indeed, when we use GDPpc along with its interaction with Afr (reported in Column 3), we observe that the interactive term captures the negative relationship, whereas GDPpc itself turns out to be positive, as expected. This is a notably interesting result indicating that being a country with a relatively higher GDPpc in Africa appears to be a disadvantage for FDI.

In contrast to columns 1 and 2, column 3 of the table, however, shows negative and significant coefficients for both ODA and lagged FDI, both of which appear as anomaly. Nevertheless, this anomaly is in fact not inconsistent with our main hypothesis that ODA and FDI lead to further FDI in the presence of favorable circumstances only, which is what we next turn to investigate. The lack of robustness of the findings may indeed suggest that the effect of ODA on FDI may not be direct.

Considering that the use of HK costs us about 300 data points and do not result in estimates much different from that reported in Column 3, we chose the specification in Column 3 as our basic model and thus proceed with the estimation of Models (2) and (3) below. In the regressions we report in Tables 2 and 3, we investigate the additional effect of governance and FMD variables on the relationship between Aid and FDI.

In Table 2, the six columns stand for the use of 6 alternative measures of the gov variable described before. In all columns, while the negatively significant coefficients of both ODA and lagged FDI remain, our hypothesis is fully supported with the observation that both of their interaction with the gov variables yield positive results. The results thus lend strong support for the reinforcing effect of governance on receiving FDI flows for ODA and FDI

receiving counties. The remainder of the control variables is also significant in the expected directions across the six columns.[15]

Table 2: Estimation of Model (2); Interactions with Gov.

Dependent Variable: sFDI $_t$

Explanatory Variables:	Gov =	Polins	Rule	Contcorr	Requal	Goveff	Voacc
(MA3sODA) $_t$		-0.22*** (-13.70)	-0.26*** (-12.50)	-0.27*** (-20.40)	-0.44*** (-20.90)	-0.31*** (-22.40)	-0.22*** (-15.50)
(MA3sODA × Gov) $_t$		0.28*** (10.20)	0.63*** (13.70)	0.80*** (24.40)	0.76*** (19.00)	0.72*** (16.90)	0.37*** (17.10)
(MA3sFDI) $_{t-1}$		-0.90*** (-108.00)	-0.90*** (-102.00)	-0.68*** (-64.90)	-1.64*** (-132.00)	-1.10*** (-105.00)	-0.71*** (-64.80)
(MA3sFDI × Gov) $_{t-1}$		1.59*** (122.00)	2.22*** (118.00)	2.01*** (72.90)	2.78*** (150.00)	2.66*** (114.00)	1.23*** (73.00)
(MA3lnGDPpc) $_t$		-0.003*** (-3.04)	0.003*** (4.61)	0.004*** (6.93)	0.003*** (5.86)	0.003*** (5.45)	0.004*** (7.61)
(MA3lnGDPpc × Afr) $_t$		-0.02*** (-16.70)	-0.02*** (-24.00)	-0.02*** (-29.50)	-0.02*** (-24.00)	-0.02*** (-23.10)	-0.02*** (-27.70)
(MA3D) $_t$		-0.04*** (-27.20)	-0.02*** (-21.30)	-0.02*** (-24.70)	-0.02*** (-14.60)	-0.02*** (-22.40)	-0.02*** (-22.20)
(σ5D) $_t$		-0.02*** (-10.20)	-0.01*** (-4.99)	-0.01*** (-4.50)	-0.003** (-1.98)	-0.01*** (-3.39)	-0.002* (-1.65)
(MA3lnREER) $_t$		-0.003*** (-9.29)	-0.003*** (-9.13)	-0.003*** (-9.07)	-0.003*** (-9.32)	-0.003*** (-10.40)	-0.002*** (-7.64)
(MA3open) $_t$		0.03*** (47.30)	0.02*** (31.90)	0.02*** (33.40)	0.02*** (34.40)	0.02*** (29.10)	0.03*** (39.60)
(MA3grGDP) $_t$		0.03*** (11.20)	0.05*** (19.00)	0.05*** (22.50)	0.05*** (19.60)	0.05*** (22.70)	0.06*** (20.60)
Constant		0.001*** (32.10)	0.001*** (42.30)	0.001*** (41.20)	0.001*** (43.40)	0.001*** (51.00)	0.001*** (34.70)
No. of observations		1270	1320	1320	1320	1320	1320
Wald (joint)		76700 [0.00]	97170 [0.00]	31370 [0.00]	154000 [0.00]	63340 [0.00]	23960 [0.00]
Wald (dummy)		1031 [0.00]	1793 [0.00]	1694 [0.00]	1884 [0.00]	2600 [0.00]	1205 [0.00]
Wald (MA3sODA terms)		247.40 [0.00]	198.30 [0.00]	618.70 [0.00]	576.40 [0.00]	1380 [0.00]	337.20 [0.00]
Wald (MA3sFDI terms)		14900 [0.00]	21780 [0.00]	10700 [0.00]	35510 [0.00]	19920 [0.00]	7993 [0.00]
Wald (MA3lnGDPpc terms)		1024 [0.00]	1380 [0.00]	2961 [0.00]	610.10 [0.00]	843.30 [0.00]	1185 [0.00]
Sargan test		82.24 [1.00]	86.34 [1.00]	86.63 [1.00]	85.65 [1.00]	85.29 [1.00]	87.43 [1.00]
m_2 test		-0.04 [0.97]	-1.03 [0.30]	-0.99 [0.32]	-1.09 [0.28]	-0.97 [0.33]	-1.18 [0.24]

Note: Numbers in parentheses are the t-ratios; numbers in brackets are the probabilities; *** indicates significance at 1% level and * indicates significance at 10% level.

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[15] One exception is the negative coefficient of GDPpc in the first column.

Next, Table 3 reports the results of the estimation of Model (3) using the three alternative measures of FMD. Similar to Table 2, we observe that while both ODA and lagged FDI exhibit negatively significant coefficients, their interaction with the FMD variables yield positive and significant coefficients. This indicates that, like good governance, developed financial markets help to reap the positive effects of aid and FDI in the form of leading to further FDI flows. The only difference from Table 2 is that σ5D loses its significance in all the runs reported.

Finally, we estimate a model where we use interactions of FDI and ODA both with gov and FMD indicators together (not reported). In table 4, we only report one of such cases (the case of rule, for the estimations the remainder of gov variables are very similar.[16] The estimation results reported in Table 4 (for gov =goveff) confirm that all the governance as well as the FMD terms contribute to the positive impact of both aid and past FDI on FDI. In other words, FMD further contributes to the environment to attract the FDI flows over and above the effect of good governance. While these results are generally robust for the cases of contcorr, goveff and requal[17], the increased potential of multicollinearity possibly accounts for the loss of the significance and unexpectedly significant signs of some variables.

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[16] These results are available from the authors upon request.

[17] For gov=contcorr and gov= polins, we observe that ODA*M2 and; for gov=contcorr, gov=rule and gov=goveff, and the subcase of fmd=sCRpr, GDPpc; and for gov=requal and polins, FDI*sCR are insignificant. In addition, FDI*m2 for the case of gov=polins; and FDI*sCR for the case of gov= voacc are negatively significant. These anomalies and insignificant results results are probably due to increased multicollinearity among the explanatory variables.

Table 3: Estimation of Model (3); Interactions with FMD.

Dependent Variable: sFDI $_t$

Explanatory variables:	FMD =	M2	sCR	sCRpr
(MA3sODA) $_t$		-0.08*** (-17.70)	-0.11*** (-15.60)	-0.12*** (-21.60)
(MA3sODA × FMD) $_t$		0.17*** (16.00)	0.71*** (21.80)	0.72*** (30.10)
(MA3sFDI) $_{t-1}$		-0.26*** (-28.50)	-0.09*** (-17.80)	-0.14*** (-19.00)
(MA3sFDI × FMD) $_{t-1}$		1.67*** (44.20)	0.93*** (34.60)	1.09*** (34.90)
(MA3lnGDPpc) $_t$		0.003*** (5.03)	0.005*** (5.69)	0.003*** (3.09)
(MA3lnGDPpc × Afr) $_t$		-0.02*** (-23.90)	-0.03*** (-27.50)	-0.02*** (-22.30)
(MA3D) $_t$		-0.02*** (-16.80)	-0.01*** (-9.45)	-0.01*** (-9.55)
(σ5D) $_t$		-0.001 (-0.70)	0.001 (0.38)	0.001 (0.17)
(MA3lnREER) $_t$		-0.003*** (-11.50)	-0.003*** (-13.20)	-0.004*** (-8.44)
(MA3open) $_t$		0.02*** (26.30)	0.02*** (26.00)	0.01*** (18.80)
(MA3grGDP) $_t$		0.08*** (39.10)	0.09*** (41.80)	0.09*** (52.20)
Constant		0.001*** (28.40)	0.001*** (29.90)	0.001*** (30.60)
No. of Observations		1316	1308	1303
Wald (Joint)		129100 [0.00]	119700 [0.00]	123000 [0.00]
Wald (Dummy)		805.30 [0.00]	892.90 [0.00]	934.20 [0.00]
Wald (MA3sODA terms)		355 [0.00]	474.50 [0.00]	906.30 [0.00]
Wald (MA3sFDI terms)		10060 [0.00]	4733 [0.00]	4292 [0.00]
Wald (MA3lnGDPpc terms)		652.30 [0.00]	759.80 [0.00]	502.50 [0.00]
Sargan test		84.55 [1.00]	80.80 [1.00]	84.09 [1.00]
m_2 test		-0.90 [0.37]	-0.85 [0.39]	-0.89 [0.38]

Note: Numbers in parentheses are the t-ratios; numbers in brackets are the probabilities;

*** indicates significance at 1% level, * indicates significance at 10% level.

Table 4: Estimation of Model (3); Interactions with both Gov and FMD.
Dependent Variable: sFDI t

Explanatory variables:	FMD =	M2	sCR	sCRpr
(MA3sODA)		-0.29*** (-8.55)	-0.35*** (-13.20)	-0.36*** (-17.40)
(MA3sODA × Goveff)		0.66*** (6.63)	0.71*** (8.67)	0.74*** (13.40)
(MA3sODA × FMD)		0.04* (1.71)	0.50*** (8.95)	0.54*** (14.00)
(MA3sFDI)(−1)		-1.09*** (-70.10)	-1.06*** (-90.20)	-1.00*** (-58.40)
(MA3sFDI × Goveff)(−1)		2.27*** (57.10)	2.40*** (78.20)	2.12*** (58.80)
(MA3sFDI × FMD)(−1)		0.83*** (17.10)	0.46*** (13.50)	0.73*** (19.70)
(MA3lnGDPpc)		0.002*** (3.18)	0.002*** (2.66)	0.001 (1.16)
(MA3lnGDPpc × Afr)		-0.02*** (-19.70)	-0.02*** (-20.50)	-0.02*** (-15.70)
(MA3D)		-0.02*** (-15.30)	-0.02*** (-16.20)	-0.02*** (-10.90)
(σ5D)		-0.01*** (-5.35)	-0.004** (-2.06)	-0.01** (-2.24)
(MA3lnREER)		-0.003*** (-7.70)	-0.003*** (-7.88)	-0.003*** (-7.09)
(MA3open)		0.02*** (26.20)	0.01*** (22.70)	0.01*** (15.80)
(MA3grGDP)		0.05*** (20.20)	0.06*** (22.60)	0.06*** (21.30)
Constant		0.001*** (28.30)	0.001*** (31.90)	0.001*** (33.10)
No. of Observations		1316	1308	1303
Wald (Joint)		31880 [0.00]	42180 [0.00]	26480 [0.00]
Wald (Dummy)		799.80 [0.00]	1019 [0.00]	1096 [0.00]
Wald (MA3sODA terms)		456.20 [0.00]	412.70 [0.00]	646.70 [0.00]
Wald (MA3sFDI terms)		11540 [0.00]	8783 [0.00]	4017 [0.00]
Wald (MA3lnGDPpc terms)		463.50 [0.00]	622.20 [0.00]	298.90 [0.00]
Sargan test		82.77 [1.00]	84.33 [1.00]	81.38 [1.00]
m_2 test		-0.99 [0.32]	-0.96 [0.34]	-0.97 [0.33]

Several papers in the literature, Albuquerque et al (2004) among others, have also pointed out the possible role of the "push" factors in influencing the FDI flows.[18] To control for such push factors, as a separate experiment, we include global variables in order to account for world economic trends that could also have an effect on FDI flows. Those control variables are the world growth rate (Wgr) and the average inflation of the G5 countries (G5inf), where both variables are in moving averages of the past 3 years as the last of the variables. To further control for the role of geographical constraints on FDI flows a dummy for being landlocked or not (Dlandlock) is also included in the regressions.[19] The regressions that include these variables yield virtually the same results as the above reported ones, while the coefficients of all these three variables are also significant in expected directions: while being landlocked negatively affects FDI, G5gr and G5inf positively affect it.[20]

4. Conclusion

Although the literature on the effects of aid and the causes and consequences of FDI is vast, and although it is commonsense to argue for existence of a positive relationship between aid and FDI is, no empirical study has yet addressed this issue satisfactorily. This study investigates the relationship between aid and FDI by testing the hypothesis that the relationship is valid only if investment environment is conducive to investment, and not necessarily otherwise. Defining good investment environment as good governance and financial market development, we test our hypothesis in a large panel data set.

Using dynamic panel data specification and GMM instruments, this paper provides strong support for our hypothesis. Based on the empirical evidence of this paper, it is

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[18] Calvo et al (1996) discussed the role of such push factors in influencing all capital flows, without a focus on FDI flows.

[19] Due to space limitations these results are not reported in a table, but are available from the authors upon request.

[20] See Albuquerque et al (2004) for discussions regarding the role of the world growth on FDI flows, Sayek (2004) for discussions regarding the role of inflation on FDI flows, and Deichmann et al (2003) for the role of geographical constraints on FDI decisions of MNFs.

possible to conclude that FDI does not necessarily flow to countries that receive aid nor does it do so in case a country has received FDI flows in the past. Rather, good governance and developed financial markets clearly appear among the conditions that reinforce the positive effect of aid and former FDI flows on the maintaining the FDI flows.

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Appendix 1: Abbreviations, Definitions and Sources of Data

Name	Definition
Afr	$= 1$ for countries in Africa; $= 0$ elsewhere.
cGDP	Gross domestic product in constant local currency in units. Source: WDI Online, NY.GDP.MKTP.KN
Contcorr	Control of corruption index. See Gov_t.
CR	Total of deposit money banks claims in local currency in units. Source: IMF IFS CD-ROM 1.1.54, 22A..ZF; 22B..ZF; 22C..ZF; 22D..ZF; 22E..MZF; 22F..ZF; 22G..ZF.
CRpr	Deposit Money Banks Claims on Private Sector in local currency in units. Source: IMF IFS CD-ROM 1.1.54, 22D..ZF.
$CRprCR_t$	$= \dfrac{CRpr_t}{CR_t}$
$dlnREER_t$	$= \ln(REER)_t - \ln(REER)_{t-1}$
FDI	The net change in liabilities of foreign direct investment in current US dollars in units. Source: WDI Online, BN.KLT.DINV.CD.WD
GDP	Gross domestic product in current local currency in units. Source: IMF IFS CD-ROM 1.1.54, 99B..ZF
$GDPgr_t$	$= \dfrac{cGDP_t - cGDP_{t-1}}{cGDP_t}$
GDPus	Gross domestic product in current US dollars in units. Source: WDI Online, NY.GDP.MKTP.CD
Goveff	Governance efficiency index. See Gov_t.
$GovInd_{ti}$	Six governance indices provided for 1996, 1998, 2000 and 2002. Source: Kaufman et al. (2003), World Bank
Gov_t	$= \dfrac{\mu_i - \min(\Omega)}{\max(\Gamma)}$ *for* $\Omega = \{\mu_1, \mu_2, ..., \mu_n\}$ *and* $\Gamma = \{(\mu_1 - \min(\Omega)), (\mu_2 - \min(\Omega)), ..., (\mu_n - \min(\Omega))\}$
human capital	Average years of secondary schooling. Data for a country at time t is taken to be the same for the subsequent years until the next available data point. Source: Barro and Lee (2000)

Name	Definition
IMF IFS	International Financial Statistics of International Monetary Fund
inf	Annual percentage of inflation in consumer prices. Source: WDI Online, FP.CPI.TOTL.ZG
inflation_t	$= \left(\dfrac{\inf_t / 100}{1 + \inf_t / 100} \right)$
lnGDPpc_t	$= \ln\left(\dfrac{GDPus_t}{pop_t} \right)$
lnREER_t	$= \ln(REER_t)$
M	Imports of goods and services in local currency in units. Source: WDI Online, NE.IMP.GNFS.CN
M2	Money and quasi money in current local currency in units. Source: WDI Online, FM.LBL.MQMY.CN
μ_t	$= \dfrac{GovInd_{1996i} + GovInd_{1998i} + GovInd_{2000i} + GovInd_{2002i}}{4}$
LI	$= 1$ for low income countries; $= 0$ elsewhere. Source: The World Bank.
ODA	The official development assistance and official aid in current US dollars in units. Source: WDI Online, DT.ODA.ALLD.CD
openness_t	$= \dfrac{X_t + M_t}{GDP_t}$
Polins	Political stability index. See Gov_t.
pop	Population in units. Source: WDI Online, SP.POP.TOTL
REER	Real effective exchange rate index for 1995=100 in units. Source: IMF
Requal	Regulatory quality index. See Gov_t.
Rule	Rule of law index. See Gov_t.
sCRpr_t	$= \dfrac{CRpr_t}{GDP_t}$
sCR_t	$= \dfrac{CR_t}{GDP_t}$

Name	Definition
sFDI$_t$	$= \dfrac{FDI_t}{GDPus_t}$
sM2$_t$	$= \dfrac{M2_t}{GDP_t}$
sODA$_t$	$= \dfrac{ODA_t}{GDPus_t}$
Voacc	Voice and accountability index. See Gov$_t$.
WDI Online	World Development Indicators Online of the World Bank
X	Exports of goods and services in local currency in units. Source: WDI Online, NE.EXP.GNFS.CN