Does Official Development Assistance Promote Foreign Direct Investment?

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Seminar in Tamkang University, New Taipei City, Taiwan
December 18, 2015

1. Introduction

Recently, there was active argument of the role of official development assistance (ODA) in facilitating foreign direct investment (FDI) inflows (e.g., Harms and Lutz 2006; Karakaplan et al. 2005; Kimura and Todo 2010). World Bank and IMF have been more interested in understanding whether foreign aid inflows from multilateral or bilateral donors have catalyzing effect to FDI. ODA and FDI are widely perceived to be alternative manners of supplementing domestic savings and promoting economic development in developing countries. There are insufficient domestic savings necessary for infrastructure investments that support economic growth, indispensable for poverty reduction in developing countries. Therefore, foreign aid has become an important source of external finance to the developing economics for long time. However, the tiring of official development assistance due to financial reasons in developed countries leads to contraction in private capital flows to developing countries. Private capital as well as foreign direct investments needed for sustainable official development assistance. And due to the more promotion of open economic policies, FDI has become another source of external finance especially after 1980s. Therefore, it is important to look for the relationship of ODA and FDI. The purpose of this paper is to provide the effects of ODA on FDI inflows to developing countries.

There is a growing body of literature to show the economic effects of foreign aid. The majority of the empirical studies (Burnside and Dollar 2000; Hansen and Tarp 2001; Dalgaard et al. 2004), we have yet to find any robust relationship between foreign aid and economic growth. However, a few studies examine the relationship between ODA and private foreign aid (e.g., Karakaplan et al. 2005; Harms and Lutz 2006; Kimura and Todo 2010; Quazi Rahim M., et al. 2014). However, the literature on the effects of ODA on FDI in developing countries has not been fully established yet.

This study contributes to previous empirical work on the effects of ODA on FDI in recipient countries by using newer version of database. It is extremely significant to analyze the relations of aid and foreign investment using new data, because there are also some countries to graduate from recipient country. This study employs panel data with 18 years and 118 countries. We estimated to employ some econometric methods such as

ordinary least squares (OLS) and System GMM (generalized method of moments).

The remainder of the paper is organized as follows: In Section 2, we review the literature. The model is specified to include the main determinants of FDI in Section3. In Section 4, employing OLS and System GMM methods, we give results for the model that governances and area dummies are taken into account, in which we examine the relations of aid and investment. Section 5 concludes.

2. Literature Review

Much of the debate on aid has focused on the effect of ODA on economic growth and the relationship between aid and savings. However, there are very few studies on the effects of the aid on FDI.

Harms and Lutz (2006)

The recent study by Harms and Lutz (2006) examine whether or not the official aid facilitates private foreign investment inflows in the recipient countries, using 1988-1999 panel data from 92 low-income and middle-income countries. Harms and Lutz (2006) distinguish foreign aids between grants, technical cooperation grants, as well as bilateral and multilateral aid and, analyze whether there exists any relationship between aid and private foreign investment (sum total of FDI and foreign portfolio investment) in developing countries in the 1990s. Harms and Lutz (2006) have already controlled for the political and institutional environment by using the 6 different measures provided by Kaufmannn et al. (1999), i.e. voice and accountability, political instability and violence, government effectiveness, regulatory burden, rule of law, graft. This study finds that the aid does not necessary facilitate foreign private investment whether the recipient country has good governance system or not.

Karakaplan et al. (2005)

Karakaplan et al. (2005) analyzes the effect of aid on FDI, using panel data on 97 countries over the period of 1960-2004. Karakaplan et al. (2005) includes control variables in their model that account for the 6 different measures provided by Kaufmannn et al. (2003). They show that aid does not necessary promote FDI inflows into recipient countries. However, if recipient country has good governance system, ODA facilitates FDI flows.

Kimura and Todo (2006)

Kimura and Todo (2006) examines the ODA-FDI causal nexus by using a ODA donor-recipient country pair data. They use the five largest ODA donor countries (France, Germany, Japan, UK, the USA) over the period of 1995 to 2002. They show that the aid in general does not facilitate FDI inflows in recipient countries. This conclusion is consistent with that proposed in Harms and Lutz (2006) and Karakaplan et al. (2005). They find foreign aid does not necessarily promote foreign direct investment in the recipient country regardless of governance system. This argument is not consistent with Karakaplan et al. (2005).

3. Model and Variable

3.1. Estimation Equation

This section verify the relationship between ODA and FDI using panel data from a sample 118 countries for the six intervals 1996-1998, 1999-2001, 2002-2004, 2005-2007, 2008-2010, 2011-2013 and the data covering 118 countries. FDI-ODA causal nexus are dynamic in nature and one of the advantages of panel data is that they allow the researcher to better understand the dynamics of adjustment. Dynamic relationships between FDI and ODA are characterized by the presence of a lagged dependent variable among the regressors. We employ the following equation,

$$FDIpc_{i,t} = \beta_1 FDIpc_{i,t} + \beta_2 ODApc_{i,t} + \beta_3 GDP_{i,t-1}$$

$$+\beta_4 d\_GDPpc_{i,t} + \beta_5 Openness_{i,t-1} + \beta_6 CPI_{i,t}$$

$$+\beta_7 Governance_{i,t} + \beta_8 \left(Governance_{i,t} \times ODApc_{i,t} \right) + u_{i,t}. \quad (1)$$

We will assume that the $u_{i,t}$ follow a one-way error component model

$$u_{i,t} = \mu_i + \varepsilon_{i,t}, \quad (2)$$

where $\mu_i \sim IID\left(0, \sigma_\mu^2\right)$ and $\varepsilon_{i,t} \sim IID\left(0, \sigma_\varepsilon^2\right)$ independent of each other and among themselves. The dynamic panel data regression described in (1) and

(2) is characterized by two sources of persistence over time. Autocorrelation due to the presence of a lagged dependent variable among the regressors and the country specific fixed effects characterizing the heterogeneity among the individuals.

Subscripts i and t denote recipient country and time, respectively. The dependent variable $FDIpc_{i,t}$ is the natural logarithm of per capita net FDI inflows to recipient country i at time t. The independent variable $ODApc_{i,t}$ is the natural logarithm of per capita total net ODA inflows to recipient country i at time t. $GDP_{i,t-1}$ denotes gross domestic product (GDP) of the recipient country i at time $t-1$. $d\_GDPpc_{i,t}$ denotes the difference of the natural logarithm of per capita gross domestic product ($GDPpc_{i,t}$) of the recipient country i at time t. The small changes in the natural logarithm of per capita GDP are directly interpretable as percentage changes, that is the growth of per capita GDP, to a very close approximation. $Openness_{i,t-1}$ denotes the sum of exports and imports of goods and services measured as a share of gross domestic product of the recipient country i at time $t-1$. $CPI_{i,t}$ denotes the inflation as measured by the consumer price index of the recipient country i at time t. $Governance_{i,t}$ denotes the quality of governance provided by Kaufmann et al. (2015). We use six aggregate indicators in Kaufmann et al. (2015), (e.g., voice and Accountability; political stability and absence of violence; government effectiveness; regulatory quality; rule of law; control of corruption). $Governance_{i,t} \times ODApc_{i,t}$ denotes the interaction terms among two variables. μ_i denotes the country-specific fixed effects giving place to regional dummy variables (e.g., East Asia & Pacific($D1$); Europe & Central Asia($D2$); Middle East & North Africa($D3$);

South Asia($D4$); Sub-Saharan Africa($D5$)). $\varepsilon_{i,t}$ denotes the error term with $E\left(\varepsilon_{i,t}\right)=0$ for all i and t.

3.2. Variables

FDI

We explain the expected signs of the variables in equation (1). The dependent variable $FDIpc_{i,t}$ is the natural logarithm of per capita net FDI inflows from all countries to the host country. In the previous studies, while Kimura and Todo (2010) and Harms and Lutz (2006) use the log of FDI stock as a dependent variable, Karakaplan et al. (2005) use the share of FDI in GDP. Among the independent variables, we conduct statistical testing of total net ODA from all countries to the recipient country. The set of 118 countries in the data is simply chosen from the World Development Indicator 2015.

GDP

GDP is used as a proxy variable for market size of the host country. The GDP data are provided by World Development Indicator 2015. Many previous researches use GDP as a control variable for market size in the estimation equation. However, on the other hand, Karakaplan et al. (2005) employ the growth rate in the real GDP. The relationship between market size and investment environment shows a positive trend. Therefore, the expected sign of GDP is positive.

The growth of per capita GDP is used as a measure of economic development. Harms and Lutz (2006) employ per capita GDP level as a control variable for economic development in estimation equation. Given the same circumstances, the relationship between high growth and economic development depicts a positive tendency. Economic development attracts foreign investment to the host country. Therefore, the expected sign of the growth of per capita GDP will be positive.

Openness

Openness variable represents the degree of openness in the trade policy

and calculated as the share of trade in GDP. Harms and Lutz (2006) and Karakaplan et al. (2005) add it as a control variable. The relationship between openness and private investment shows a positive trend because foreign investment firms tend to use the host country as an export-base to home or third country. The expected sign of the openness will be positive. The data source of openness is the World Development Indicator 2015.

CPI

CPI represents the consumer price index and is used as a measure of investment risk. Under the same circumstances is a higher value of this variable, the degree of risk for foreign investors indicates a higher. The expected sign of the CPI will be negative. The data source of openness is the World Development Indicator 2015.

Governance

The governance quality is used as a proxy variable for the marginal effect of the capital of the host country. The Worldwide Governance Indicators provided by Kaufmannn et al. (2015) are constructed using unobserved components and are measured in units ranging between -2.5 and +2.5 inclusive. Giving the same circumstances a higher value of this variable, the marginal return on capital for foreign investors indicates a higher. The Worldwide Governance Indicators capture six key dimensions of governance (e.g., voice and Accountability; political stability and absence of violence; government effectiveness; regulatory quality; rule of law; control of corruption). In the correlation coefficients test, the correlations are high. Therefore in this paper, two or more governance indicators were not used at the same estimation. The sign of the governance is expected to be positive because the marginal effect of the capital will be low under bad governance.
We conduct statistical testing of the interaction terms between governance and ODA per capita following Harms and Lutz (2006) and Karakaplan et al. (2005). The sign of the interaction terms is expected to be positive if ODA promote FDI inflows to recipient countries under good governance.

3.3. Estimation Method

Orthogonality Assumption

We employ two different estimation methods OLS and System GMM. We start with ordinary least squares (OLS) estimation using robust standard errors. The OLS estimators are consistent only when all regressors are orthogonal to the error term. However, there are two reasons why the orthogonality assumption may not hold in our FDI regression.

Endogeneity

The first reason is because there is likely to be a correlation between foreign aid and the shocks affecting FDI. The second reason is because there is likely to be a correlation between foreign aid and the country specific fixed effects.

Endogeneity can arise as a result of a loop of causality between the independent and dependent variables of a model. Endogeneity leads to a biased OLS estimate. The fact is known that OLS estimators are very different from estimators correcting for endogeneity (e.g., Hansen and Tarp 2001; Burnside and Dollar 2000).

System GMM

Therefore, in order to correct for biases arising from endogeneity, we employ the system generalized method of moment (GMM) estimation developed by Blundell and Bond (1998). In the system GMM estimation, we use lagged differences of $FDIpc_{i,t}$ as instruments for equations in levels (equation (1)), in addition to lagged levels of $FDIpc_{i,t}$ as instruments for equations in first differences of equation (1). The reason why the lagged regressors can be used as instruments is that they are predetermined and thus should not be correlated with the contemporaneous error term. We apply the two-step procedure to the system GMM estimation to obtain larger efficiency. This can make two-step robust more efficient than one-step robust. In addition, we use Windmeijer's (2005) methodology to obtain robust standard errors. The estimator thus obtained is consistent even in the

presence of heteroskedasticity and corrects for finite sample biases found in the two-step estimations. We test whether instruments are orthogonal to the error term using the Hansen j statistic. And we conduct statistical testing whether the error term is auto-correlated using the Arellano-Bond statistic.

4. Results and discussion

ODA and Governance

Table 1-6 presents the results on whether the FDI net inflows from all countries to the recipient country is dependent on total net ODA from all countries in the recipient country. The coefficient of the aid variable is positive and significant using OLS method. Although, results using system GMM method show that the isolated effect of the aid variable is not significant except in the case of using the governance indicator of regulatory quality and government effectiveness to control for the institutional environment. This means that ODA does not necessarily facilitate the foreign investment. This result is consistent with Kimura and Todo (2010), Harms and Lutz (2006) and Karakaplan et al. (2005).

And we find that the coefficient of the governance variable is positive and significant except for using political stability and absence of violence in the case method of OLS. But, the coefficient of the governance variable is positive and not significant except for using rule of law in the case method of system GMM. This result means that good governance does not necessarily facilitate the foreign investment. This result is consistent with Kimura and Todo (2010) and Harms and Lutz (2006). Where, Harms and Lutz (2006) show that the coefficient of the governance variable are positive and statistically significant using only government effectiveness and Graft.

Furthermore, we find that the coefficients of the interaction terms between governance and ODA per capita are in general ambiguous. Based on the empirical evidence of this paper, it is possible to conclude that FDI does not necessarily flow to countries under good governance. This result is consistent with Kimura and Todo (2010), but is not consistent with Karakaplan et al. (2005). Karakaplan et al. (2005) show that ODA promote FDI inflows to the recipient country under good governance.

Other control variables

Results on other control variables are as following. We find that the coefficient of the lagged variable of FDI is positive and significant as with many previous researches in system GMM method. This mean that FDI on the previous period is a higher value, FDI on this period indicates a higher.

The recipient country's GDP and the growth of per capita GDP have a positive and significant effect on FDI inflows to the recipient country in both methods. These results are consistent with recent studies.

Openness is positive and significant in the case using OLS method. While using system GMM, openness is positive but not significant except for using the governance indicator of regulatory quality, government effectiveness and control of corruption to control for the institutional environment. This means that openness does not necessarily attract foreign investment. This result is not consistent with Harms and Lutz (2006) and Karakaplan et al. (2005). They show that openness is positive and significant. Furthermore, we find that the effect of CPI on FDI is ambiguous in both method. This means that CPI does not affect the behavior of foreign investors.

5. Conclusions

The previous empirical studies investigate the causal nexus between official aid and private foreign investment for a long time. This paper examines the relationships between ODA and FDI which have recently received attention. We consider values for the six intervals 1996-1998, 1999-2001, 2002-2004, 2005-2007, 2008-2010, 2011-2013 and the data covering 118 countries. In other words, this study investigates whether or not FDI inflows from all countries is affected by recipient country's total net ODA. Also, this study analyzes how governance quality of the recipient country enhances the role of ODA in facilitating FDI inflows to the recipient country.

The findings of this study show the following three points. First, verify that the isolated effect of ODA on FDI is in general insignificant. This result is consistent with Kimura and Todo (2010) and Harms and Lutz (2006), but not with Karakaplan et al. (2005). Karakaplan et al. (2005) point out that the role of ODA does not facilitate the foreign investment. Secondly, show that

the isolated effect of governance does not enhance the ODA effect on FDI except for countries in which private agents face higher values of rule of law.

Where, Harms and Lutz (2006) show that the coefficient of the governance variable are positive and statistically significant using only government effectiveness and graft. Thirdly, point out that the coefficient of the interaction terms between governance and aid variable is ambiguous This means that the aid does not facilitate foreign private investment even if the recipient country has good governance system. This result gives similar result to Harms and Lutz (2006). Harms and Lutz (2006) show that the coefficient of the interaction terms is negative and statistically significant using only regulatory burden. But, our result is not consistent with Karakaplan et al. (2005).

We would like to examine the donor-recipient country pair relationship using matching data between Japan and developing countries for future research.

Data Appendix

We employ data from the following sources: World Developing Indicator 2015, Kaufmann et al. (2015).

1) Net foreign direct investment inflows (*FDIpc*): Foreign direct investment refers to direct investment equity flows in the reporting economy. It is the sum of equity capital, reinvestment of earnings, and other capital. Direct investment is a category of cross-border investment associated with a resident in one economy having control or a significant degree of influence on the management of an enterprise that is resident in another economy. Ownership of 10 percent or more of the ordinary shares of voting stock is the criterion for determining the existence of a direct investment relationship. Data are in current U.S. dollars. Source: World Bank(2015).

2) Net total ODA inflows (*ODApc*) : Net official development assistance (ODA) per capita consists of disbursements of loans made on concessional terms (net of repayments of principal) and grants by official agencies of the members of the Development Assistance Committee (DAC), by multilateral institutions, and by non-DAC countries to promote economic development and welfare in countries and territories in the DAC list of ODA recipients; and is calculated by dividing net ODA received by the midyear population estimate. It includes loans with a grant element of at least 25 percent (calculated at a rate of discount of 10 percent). Source: World Bank(2015).

3) Nominal Gross Domestic Product (*GDP*): GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars. Dollar figures for GDP are converted from domestic currencies using single year official exchange rates. For a few countries where the official exchange rate does not reflect the rate effectively applied to actual foreign exchange transactions, an alternative conversion factor is used. Source: World Bank(2015).

4) Nominal Gross Domestic Product per capita (*GDPpc*): GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars. Source: World Bank(2015).

5) Degree of Openness (*Openness*): Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product. Source: World Bank(2015).

6) Inflation rate (*CPI*): Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used. Source: World Bank(2015).

7) Governance indicators (*Governance*):
①Voice and Accountability: Voice and accountability captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. Source: Kaufmann et al. (2015).
②Political Stability and Absence of Violence: Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism. Source: Kaufmann et al. (2015).
③Government Effectiveness: Government effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Source: Kaufmann et al. (2015).
④Regulatory Quality: Regulatory quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Source:

Kaufmann et al. (2015).

⑤Rule of Law: Rule of law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Source: Kaufmann et al. (2015).

⑥Control of Corruption: Control of corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. Source: Kaufmann et al. (2015).

Table 1: The effects of ODA on FDI with regulatory quality

Dependent Variable FDIpc	OLS	GMM
	Regulatory Quality	
FDIpc_1		0.573***
		(0.141)
ODApc	0.387***	0.187*
	(0.0584)	(0.112)
GDP_1	0.201***	0.0429***
	(0.0468)	(0.0132)
d_GDPpc	1.326***	1.052**
	(0.401)	(0.405)
Openness_1	0.0148***	0.00591*
	(0.00180)	(0.00317)
CPI	0.00333	0.00374
	(0.00248)	(0.00384)
Governance	1.686***	1.174
	(0.350)	(0.826)
ODApc×Governance	-0.196**	-0.144
	(0.0794)	(0.160)
East Asia & Pacific	-1.227***	-0.108
	(0.202)	(0.388)
Europe & Central Asia	-0.623***	-0.467*
	(0.180)	(0.280)
Middle East & North Africa	-1.161***	0.149
	(0.213)	(0.758)
South Asia	-1.980***	-0.341
	(0.216)	(0.561)
Sub-Saharan Africa	-1.408***	-0.535
	(0.159)	(0.459)
Constant	-2.259*	
	(1.268)	
Observations	532	531
R-squared	0.516	
p-value of AR(1) test		0.057
p-value of AR(2) test		0.291
p-value of Hansen test		0.521

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2: The effects of ODA on FDI with voice and accountability

Dependent Variable FDIpc	OLS	GMM
	Voice and Accountability	
FDIpc_1		0.626***
		(0.137)
ODApc	0.335***	0.137
	(0.0619)	(0.124)
GDP_1	0.267***	0.0549***
	(0.0463)	(0.0143)
d_GDPpc	1.179***	1.019**
	(0.416)	(0.428)
Openness_1	0.0168***	0.00406
	(0.00191)	(0.00271)
CPI	-0.00138	0.000491
	(0.00241)	(0.00287)
Governance	0.415*	0.406
	(0.243)	(0.551)
ODApc×Governance	0.103*	-0.0443
	(0.0586)	(0.116)
East Asia & Pacific	-1.206***	-0.243
	(0.210)	(0.373)
Europe & Central Asia	-0.284	-0.496
	(0.182)	(0.333)
Middle East & North Africa	-0.633***	-0.783
	(0.234)	(0.648)
South Asia	-2.100***	-0.523
	(0.202)	(0.631)
Sub-Saharan Africa	-1.317***	-0.910
	(0.162)	(0.571)
Constant	-3.870***	
	(1.270)	
Observations	532	531
R-squared	0.506	
p-value of AR(1) test		0.057
p-value of AR(2) test		0.305
p-value of Hansen test		0.519

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: The effects of ODA on FDI with political stability and absence of violence/terrorism

Dependent Variable FDIpc	OLS	GMM
	Political Stability and Absence of Violence/Terrorism	
FDIpc_1		0.566***
		(0.120)
ODApc	0.358***	0.198
	(0.0662)	(0.134)
GDP_1	0.316***	0.0759***
	(0.0481)	(0.0157)
d_GDPpc	1.019**	1.180***
	(0.406)	(0.435)
Openness_1	0.0140***	0.00226
	(0.00174)	(0.00232)
CPI	-0.000533	0.00128
	(0.00279)	(0.00275)
Governance	0.138	0.0872
	(0.193)	(0.254)
ODApc×Governance	0.159***	0.0683
	(0.0426)	(0.0616)
East Asia & Pacific	-1.723***	-1.275***
	(0.181)	(0.428)
Europe & Central Asia	-0.402**	-0.576
	(0.173)	(0.427)
Middle East & North Africa	-1.054***	-1.371*
	(0.183)	(0.731)
South Asia	-2.222***	-0.374
	(0.202)	(1.435)
Sub-Saharan Africa	-1.589***	-1.373**
	(0.168)	(0.666)
Constant	-4.598***	
	(1.329)	
Observations	528	527
R-squared	0.530	
p-value of AR(1) test		0.056
p-value of AR(2) test		0.291
p-value of Hansen test		0.582

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4: The effects of ODA on FDI with government effectiveness

Dependent Variable FDIpc	OLS	GMM
	Government Effectiveness	
FDIpc_1		0.561***
		(0.144)
ODApc	0.371***	0.204*
	(0.0598)	(0.117)
GDP_1	0.189***	0.0497***
	(0.0485)	(0.0128)
d_GDPpc	1.268***	0.943**
	(0.401)	(0.454)
Openness_1	0.0138***	0.00587*
	(0.00186)	(0.00307)
CPI	0.00157	0.00295
	(0.00235)	(0.00316)
Governance	1.487***	1.172
	(0.345)	(0.821)
ODApc×Governance	-0.130	-0.156
	(0.0805)	(0.161)
East Asia & Pacific	-1.500***	-0.366
	(0.192)	(0.409)
Europe & Central Asia	-0.593***	-0.528*
	(0.169)	(0.293)
Middle East & North Africa	-1.350***	-0.0451
	(0.190)	(0.895)
South Asia	-2.413***	-0.363
	(0.176)	(0.971)
Sub-Saharan Africa	-1.485***	-0.661
	(0.148)	(0.450)
Constant	-1.632	
	(1.333)	
Observations	532	531
R-squared	0.532	
p-value of AR(1) test		0.061
p-value of AR(2) test		0.307
p-value of Hansen test		0.459

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5: The effects of ODA on FDI with rule of law

Dependent Variable FDIpc	OLS	GMM
	Rule of Law	
FDIpc_1		0.595***
		(0.126)
ODApc	0.356***	0.140
	(0.0573)	(0.0940)
GDP_1	0.272***	0.0667***
	(0.0439)	(0.0150)
d_GDPpc	1.292***	1.050**
	(0.392)	(0.414)
Openness_1	0.0140***	0.00371
	(0.00175)	(0.00257)
CPI	0.000941	0.00213
	(0.00254)	(0.00263)
Governance	1.132***	1.026*
	(0.290)	(0.598)
ODApc×Governance	-0.0342	-0.139
	(0.0683)	(0.118)
East Asia & Pacific	-1.547***	-0.743**
	(0.176)	(0.294)
Europe & Central Asia	-0.496***	-0.436
	(0.168)	(0.305)
Middle East & North Africa	-1.605***	-0.543
	(0.183)	(0.676)
South Asia	-2.648***	-0.870
	(0.163)	(0.935)
Sub-Saharan Africa	-1.540***	-0.720*
	(0.149)	(0.391)
Constant	-3.392***	
	(1.215)	
Observations	532	531
R-squared	0.545	
p-value of AR(1) test		0.057
p-value of AR(2) test		0.292
p-value of Hansen test		0.475

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6: The effects of ODA on FDI with control of corruption

Dependent Variable FDIpc	OLS	GMM
	Control of Corruption	
FDIpc_1		0.574***
		(0.130)
ODApc	0.340***	0.102
	(0.0596)	(0.0831)
GDP_1	0.255***	0.0669***
	(0.0457)	(0.0148)
d_GDPpc	1.367***	1.152***
	(0.392)	(0.410)
Openness_1	0.0144***	0.00501*
	(0.00174)	(0.00267)
CPI	0.000433	0.00143
	(0.00277)	(0.00280)
Governance	1.071***	0.916
	(0.282)	(0.590)
ODApc×Governance	0.00760	-0.0941
	(0.0629)	(0.119)
East Asia & Pacific	-1.175***	-0.542**
	(0.183)	(0.264)
Europe & Central Asia	-0.290*	-0.272
	(0.170)	(0.351)
Middle East & North Africa	-1.276***	-0.743
	(0.176)	(0.680)
South Asia	-2.354***	0.239
	(0.191)	(0.908)
Sub-Saharan Africa	-1.473***	-0.741*
	(0.139)	(0.434)
Constant	-3.103**	
	(1.274)	
Observations	532	531
R-squared	0.552	
p-value of AR(1) test		0.056
p-value of AR(2) test		0.291
p-value of Hansen test		0.491

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7: The effects of ODA

	Dependent Variable	①ODA (isolated effect)	②Governance (isolated effect)	Interaction terms(①×②)
Harms and Lutz (2006)	FDI inflows per capita	positive and in general not significant except for using regulatory burden	positive and in general not significant using government effectiveness and Graft	negative and in general not significant except for using regulatory burden
Kimura and Todo (2006)	FDI inflows	Ambiguous signs and not significant	Ambiguous signs and not significant	positive and not significant
Karakaplan et al. (2005).	the share of FDI in GDP	negative and significant		positive and significant
Koyama and Jen(2015)	FDI inflows per capita	positive and in general not significant except for using regulatory quality and government effectiveness	positive and in general not significant except for using rule of law	Ambiguous signs and not significant

Table 8: Sample Countries

Albania	Croatia	Liberia	Seychelles
Algeria	Dominica	Macedonia, FYR	Sierra Leone
Angola	Dominican Republic	Madagascar	Solomon Islands
Antigua and Barbuda	Ecuador	Malawi	South Africa
Armenia	Egypt, Arab Rep.	Malaysia	Sri Lanka
Azerbaijan	El Salvador	Mali	St. Kitts and Nevis
Bangladesh	Equatorial Guinea	Mauritania	St. Lucia
Barbados	Eritrea	Mauritius	St. Vincent and the Grenadines
Belize	Ethiopia	Mexico	Sudan
Benin	Fiji	Moldova	Swaziland
Bhutan	Gabon	Mongolia	Tajikistan
Bolivia	Georgia	Morocco	Tanzania
Bosnia and Herzegovina	Ghana	Mozambique	Thailand
Botswana	Grenada	Namibia	Togo
Brazil	Guatemala	Nepal	Tonga
Burkina Faso	Guinea	Nicaragua	Trinidad and Tobago
Burundi	Guinea-Bissau	Niger	Tunisia
Cabo Verde	Haiti	Nigeria	Turkey
Cambodia	Honduras	Oman	Turkmenistan
Cameroon	India	Pakistan	Uganda
Central African Republic	Indonesia	Palau	Uruguay
Chad	Iraq	Panama	Uzbekistan
Chile	Jamaica	Paraguay	Vanuatu
China	Jordan	Peru	Venezuela, RB
Colombia	Kazakhstan	Philippines	Vietnam
Comoros	Kenya	Rwanda	West Bank and Gaza
Congo, Dem. Rep.	Kiribati	Samoa	Zambia
Congo, Rep.	Kyrgyz Republic	Sao Tome and Principe	Zimbabwe
Costa Rica	Lao PDR	Senegal	
Cote d'Ivoire	Lesotho	Serbia	

Table 9: The change of per capita ODA provided

DAC members ODA per capita(US dollar)	1960-69年	1970-79年	1980-89年	1990-99年	2000-09年	2010-14年
Norway	3.6	45.7	163.4	284.1	559.4	975.7
Luxembourg			25.9	166.6	550.0	777.3
Liechtenstein						773.7
Sweden	5.6	59.3	131.2	215.0	347.0	575.2
Denmark	3.8	40.5	117.0	286.9	391.2	515.8
Switzerland	2.1	15.5	58.3	135.0	201.1	378.0
Netherlands	6.4	45.5	112.8	184.5	294.5	349.3
United Arab Emirates		1891.2	627.6	391.4	179.9	270.4
Finland	0.9	8.4	60.9	99.7	145.0	263.3
United Kingdom	8.4	17.3	34.0	55.7	138.4	244.8
Belgium	9.4	33.0	56.4	83.9	161.0	231.1
Australia	10.1	28.8	50.6	57.5	86.0	204.6
Ireland			12.3	37.1	171.2	186.3
France	17.1	24.8	67.7	122.6	132.0	181.9
Germany	5.8	19.7	47.0	82.1	107.6	173.9
Canada	6.0	31.4	62.9	74.1	93.2	146.7
Austria	1.2	8.8	29.1	47.8	127.6	136.1
Saudi Arabia		248.2	267.4	47.3	78.7	133.3
United States	18.0	18.6	35.3	36.5	67.2	98.8
New Zealand	3.5	13.4	22.6	31.8	53.9	98.3
Iceland					88.6	93.6
Japan	2.3	11.0	43.4	89.3	79.5	83.5
Spain			5.8	32.8	77.7	70.5
Kuwait		471.3	419.4		66.0	64.1
Italy	1.7	3.8	30.1	45.8	53.6	56.2
Portugal			3.0	24.3	43.8	54.1
Malta						43.3
Greece					36.1	31.5
Korea				3.1	10.5	30.8
Turkey				1.3	5.8	30.6
Cyprus						30.0
Slovenia						29.5
Israel					16.7	23.6
Czech Republic					11.9	21.3
Estonia					6.6	20.3
Lithuania					6.4	15.8
Slovak Republic					7.6	15.0
Hungary			6.4			13.0
Poland			0.3		4.8	11.3
Latvia						10.3
Romania						6.9
Bulgaria						6.2
Russia						3.7
Thailand						0.4

(Source: OECD internet database)

Table 10: Net ODA received per capita in developing countries

Net ODA received per capita(US dollar)	1960-69年	1970-79年	1980-89年	1990-99年	2000-2009年	2010-2013年
East Asia & Pacific	89.82	178.13	332.75	671.59	1808.61	5229.76
Latin America & Caribbean	336.34	978.17	1804.62	3230.24	4892.27	8972.03
Middle East & North Africa					2319.69	4451.28
South Asia	101.46	162.77	301.48	377.19	705.12	1386.22
Sub-Saharan Africa	154.95	368.20	585.91	553.76	832.32	1665.91

(Source: the World Development Indicator 2015)

Table 11: Net FDI received per capita in developing countries

Net FDI received per capita(US dollar)	1960-69年	1970-79年	1980-89年	1990-99年	2000-2009年	2010-2013年
East Asia & Pacific		0.40	2.46	23.74	63.69	154.02
Latin America & Caribbean		6.24	14.39	61.40	141.38	268.20
Middle East & North Africa		3.03	4.40	7.26	58.97	54.66
South Asia		0.03	0.25	1.74	12.28	20.43
Sub-Saharan Africa		2.47	2.82	7.26	25.01	33.44

(Source: the World Development Indicator 2015)

Table 12: Descriptive Statistics

Variable	Description	Mean	Std. Dev.	Max	Min	Missing value
FDIpc	Log of nominal FDI inflow to recipient country	1.63	0.84	3.56	-2.40	2
ODApc	Log of nominal ODA inflow to recipient country	1.57	0.61	3.54	-0.95	4
GDP_1	Log of nominal GDP of recipient country(lagged)	9.88	0.89	12.72	7.83	4
d_GDPpc	Difference in log of Per capita GDP of recipient country	0.09	0.10	0.47	-0.24	4
Openness_1	Exports plus imports(as a % of GDP)	81.83	41.39	478.87	16.16	3
CPI	Consumer price index	11.47	62.49	1490.52	-4.69	68
RQ	Regulatory Quality	-0.40	0.69	1.64	-2.22	11
VA	Voice and Accountability	-0.35	0.81	1.47	-2.18	0
PS	Political Stability and Absence of Violence/Terrorism	-0.40	0.91	1.42	-2.83	12
GE	Government Effectiveness	-0.45	0.67	1.60	-2.04	12
LAW	Rule of Law	-0.46	0.73	1.45	-2.23	0
CORR	Control of Corruption	-0.43	0.66	1.76	-2.06	12

Table 13: Correlation Coefficients

Variable	FDIpc	ODApc	GDP_1	d_GDPpc	Openness	CPI	RQ	VA	PS	GE	LAW	CORR
FDIpc	1	0.082	0.070	0.214	0.362	-0.047	0.470	0.395	0.425	0.468	0.424	0.431
ODApc	0.082	1	-0.701	-0.025	0.158	-0.042	-0.108	0.189	0.272	-0.089	0.159	0.095
GDP_1	0.070	-0.701	1	0.105	-0.261	0.024	0.234	-0.147	-0.307	0.193	-0.097	-0.080
d_GDPpc	0.214	-0.025	0.105	1	0.224	-0.002	-0.109	-0.147	-0.024	-0.090	-0.114	-0.151
Openness_1	0.362	0.158	-0.261	0.224	1	-0.016	0.038	0.046	0.311	0.107	0.178	0.112
CPI	-0.047	-0.042	0.024	-0.002	-0.016	1	-0.150	-0.127	-0.153	-0.095	-0.140	-0.112
RQ	0.470	-0.108	0.234	-0.109	0.038	-0.150	1	0.706	0.516	0.862	0.760	0.737
VA	0.395	0.189	-0.147	-0.147	0.046	-0.127	0.706	1	0.635	0.691	0.761	0.695
PS	0.425	0.272	-0.307	-0.024	0.311	-0.153	0.516	0.635	1	0.616	0.741	0.675
GE	0.468	-0.089	0.193	-0.090	0.107	-0.095	0.862	0.691	0.616	1	0.858	0.843
LAW	0.424	0.159	-0.097	-0.114	0.178	-0.140	0.760	0.761	0.741	0.858	1	0.864
CORR	0.431	0.095	-0.080	-0.151	0.112	-0.112	0.737	0.695	0.675	0.843	0.864	1

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