

# Macroeconomic Determinants of Official Development Assistance in Developing Countries: A Cross Country Panel Study

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## Abstract

*Across the many countries, official development assistance (ODA) have significant contributions to accelerate gross domestic products (GDP's), mitigate foreign currency shortfalls and conducive in trade balances. Including monetary and fiscal factors, money markets and current account balances are the significant determinants of ODA in upper and lower middle-income countries. However, significance levels are stronger in lower than upper middle-income countries, but findings trigger that both income level countries, few macroeconomic factors have multifaced impact the magnitude of ODA in diverse ways. Portends, perplexing money markets and balancing shortfalls not only persuasive to spread contagion effects but also manipulates dilatory, desultory and disconcerting capital flows in an economy. And, ensues estimated values are significantly coherent to the established macroeconomic theoretical believes and exhort to adopt manoeuvres in implementation strategies by developing countries. Paper uses panel data analysis by applying methodologies, conducts methodical redundancies, validity and reliability tests. Infer by stressing the need for strong monetary and fiscal policies by institutions to response systematic instrumentations and government to create an appropriate standard implementation of ODA to make full use of ODA's developmental potential.*

JEL Classifications: E6, F24, F33, F45.

Keywords: ODA, Macroeconomics, Panel Data Regressions, Monetary and Fiscal Policy, Developing Countries.

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## 1. Introduction

ODA is a source of capital for many developing countries. Over the years, developing countries are using this in capital stock to improve their infrastructure which may have spill over effects to overall output. Historically and more importantly, aid helps to maintain trade balance by its multiplicative impact in economies by offsetting foreign currency shortfalls. Though many countries have developed their financial system substantially by last two decades but most of the developing and least developing countries are still grappling to meet their financial needs. Lack of financial instruments and limited access to diverge credit worthiness have implicit impact to look for ODA. Instead of finding systematic defaults line, countries trade off easy but pursue complicated solutions. Hence, it incurs not only costs but delay the development process. Whereas countries need to underpin appropriate statue and manoeuvre development to manipulate the indicators and instruments rather they follow the open-door policy. Yet, the disconcerted open-door policy is not all time welcoming but expensive and cost generating's.

Usually open-door policy is catastrophic and counterproductive for many countries. In one-hand, ODA capital is becoming a part of production function e.g. capital stock, on the other hand capital flight is costing the trade balance and stifle overall output. Though the system is not possible to develop by overnights but can be started processes to bring down under control. To manipulate, systems need to identify specious reasoning behind the veil. To unveil encore elements, need to signify the factors which acts as a proviso to attract ODA towards countries. Initial instinct is numerous core macroeconomic factors works as an agent but need to specify few which can fall under control

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management. Identification of relevant factors follows complicated but explicit relational frame theory whereas factors have close and dynamic externalities to the other macroeconomic factors. In term of relational frame theory, agents have dynamic relationship with stimuli to instigate to function others. The strive of this study is to find substantive factors to create sententious policy recommendations. Indeed, integrate factors with monetary and fiscal policy implementation and turn them into prevailing practices.

To suggest concise policy is comparatively easy but undertake in practice to pursue is much harder. Because, numerous constrains remain questionable across the countries. However, study focuses on identification of minimum but influential factors which can be controlled to maximise macroeconomic efficiency and ken consistent performance to maintain output. Even, many questions remain unresolved whether or not will these specifications can help to create puissant homogenous policy environment? However, ODA may have nexus with the macroeconomic factors but;

Are there any theoretical relationships extant between ODA and macroeconomics factors?

Does ODA have any manipulating power to work as an instrument?

If ODA has an array power, which macroeconomics factors have decisive power?

To find the answers, the paper will look at different aspects of the relationship and limn the righteous guidelines for further actions. The rest of this paper is organised as follows: section two; review the relevant literature, section three; discuss model validity, methodologies and robustness tests, section four; data is analysed and discuss with relevant literature and in final section infer the findings and provide policy recommendations.

## **2. Literature Review and Hypothesis Development**

### **2.1 Theoretical Review**

ODA have diverse facets and it's efficiency depends on donor's so called "self-interests" and recipient nation's "needs" and implementation strategies. Yet, former two aspects are discernible and have numerous contentious and consensus literatures by different means, but one thing is common; still ODA is functioning among nations and agencies. Indeed, over the years many studies have been published and measured the ODA's effectiveness and driving forces, but academics not yet focused on inherent macroeconomics factors which stimulate the recipient's needs. Overwhelmingly it's true that few terminologies have strong and illusorily discussed in literatures but not ascertain to implement in policy level to create amicable homogenous macro environment. However, the study cannot deny the illustrious and visible specious reasoning of first two quotation marks "needs" and "self-interests", current review relates these as lag-effects and detract them to substantiate.

Donor's pursue towards recipients' nations to full fill subdue self-interest e.g. economic and political benefits by amicable relationship while beneficiaries looks for mitigate own nonplus demand. Over the times, within the stress and strain conditions donors prevail and uphold their demeanour proposition to allocate assistance (Little and Mckinlay, 1977; Maizels and Nissanke, 1984; Alesina and Dollar, 2000). However, donors' docile norms are humanitarians and welfare contributions but utter objectives to stimulate self-interest (Mckinlay et al. 1977). Indeed, in case of bilateral assistance something other than aid e.g. security, foreign policy and business strategies gets priority but in multilateral cases focus on recipients' demand (Maizels and Nissanke, 1984:891).

Recipient's nations look to resolve diverse economics and financial issues by absorbing foreign currency assistance. Over the year's facts remain unresolved but demand multitude. Studies carried out by (Papanek, 1972; Dowling and Hiemenz, 1982; Gupta and Islam, 1983; Burnside and Dollar, 1997; Hansen and Tarp, 2000; Dalgaard et al. 2004; Gomanee et al. 2005; and Karass, 2006) have found that ODA has a significant positive effect on economic growth. In addition, many studies support that ODA have diverse contributions to the welfare and trade development (Kosack, 2003; McGillivray, 2009; and Sakyi, 2011).

In term of theoretical believes, there has bilateral effects of ODA and partisans' objectives have parities to be mutually benefited. Moreover, benefits are depending on economic husbandries and efficiencies. Yet, the studied focused on visible benefits but not yet divulge the encore macroeconomics facts that stimulates the recipient's nations to pursue over the years to get ODA aid. In section 2.2, paper has overviewed the nexus between ODA and macroeconomics factors.

## **2.2 Empirical Review**

Motivation of this literature review is to ensue encore macroeconomics factors which have implications with ODA. Although diverge but concept related studies have been worked with differently, but inducement not been studied yet. Studies reveals that developing countries looks for foreign assistance to elevate poverty (McGillivray, 2005). However, poverty reduction is inversely proportionate to investment and ergo, recipients' nations may give sorts of intensive to others by taking aid. Although, the effectiveness of aid is commensurate to the rule of law, democracy and policy environment (Burnside and Dollar, 1997). Their findings may have implicit connections with foreign investment and trade opportunities where donor's finds to work with. Indirectly it can be presumed that unemployment, export, import and trade balance may have well nexus with ODA to attract. The thought behind this is donor's self-interest to investment or get priority in terms of crave. Though certainly but roughly it can be said that there has not any previous studies ascertain that macroeconomic nexus with ODA. The study keeps that hypothesis there may have extant of positive effects of macroeconomic factors to pull ODA and forthright scope to exploit.

Snyder (1993) reveals that country's size has significant effects to attract ODA. Moreover, Burnside and Dollar (1997) found that policy environment has great influence to attract assistance. However, their findings failed to mention stylized of policy and subjective size effects. Reserve of resources in recipient's countries have positive correlation to attract ODA (Mbaku, 1993). The reasons may have behind that donors can access to the resources and recipients can allocate the aid to economic growth. Myopic wry means short-run mutual benefits get priority instead of facts finding to resolve long-term problems. Though, Svensson (1998) argued that large capital flow contributes to welfare contributions but equivocally intrude rent seeking activities hence reduce government effectiveness. Instead of specifying the elements of fine tune economies, beneficiaries' looks to create welfare economy which is not only illusion but overweening the prosperity.

Numerous but dynamic implicit effects stimulate to attract ODA have been divulged over the years where diverse but co-integrated elements name mentioned e.g. fungibility of foreign aid, bad economic management, corruption, underutilisation of aid, poor economic policies, aid dependency, lack of coordination and cooperation among agencies investment. Though some of them are extraneous factors but misappropriation of economic management can have significant effects. Even some studies have identified high level of indebt, credit worthiness, conflict of private and public investment strategies and lack of institutions trigger to look for foreign assistance (Alesina and Tabellini, 1989; Rodrick, 1991; Aizenmann and Marion, 1993; Larrain and Vergara, 1993; Mlambo and Oshikoya, 2001).

Extent of foreign aid can be a decisive factor in the economic development of developing economies remains controversial. Moreover, it is observed that foreign assistance may be beneficial in certain countries, but not many. Performance of foreign assistance depends on different preconditions like; geographical conditions, economic policies, political policies of the ruling government, bureaucratic efficiencies, the role of institutions, the level of socioeconomic development and the level of technological development achieved. These factors differ across the regions and responsible for the variability found in the role and achievement of foreign assistance from country to country.

Aid can have stimulating effects on private investment by relaxing foreign exchange constraints, contentious debt overhang, and increasing macro-economic instability. In addition, if aid is used to invest in public sector developments such as education, research and development, or physical infrastructure, which can help to goad private service and production development. If public investment parlays and investors start to use scarce resources, which are essential to private sector developments, it can push down private investments and create a combined force to crowd out private investors from the market. The controversial literature suggests that aid has statistically significant negative impact on private investment and crowds out private investments. It also found that long-run causalities run in both directions, suggesting that an increase in aid reduces private investment and that, in turn, the higher investment reduces the aid flows. The flow of ODA not only crowd out the domestic investment but also help to capital flight and wry the economy. Altogether, ODA may raise concern in financial, macroeconomics and trade along with other sources of capital stocks. The study is perspicacious to find pivotal stimulating macroeconomic factors to attract ODA towards developing world. The findings can contribute to integrate factors towards instrumental processes to ease the concerted development.

### 3. Method of Estimation, Model Equation and Data

#### 3.1 Model and Methodology

To explore the hypothesis, we make use of panel data including as many as forty countries over the period of 1996 to 2015. The empirical relationship between ODA and macroeconomic determinants is developed from Barro et.al (1998) is written as follows:

$$\begin{aligned} ODA_{GDP_{i,t}} = & \beta_0 + \beta_1 \text{lending interest rate}_{i,t} + \beta_2 \text{Inflation}_{i,t} + \beta_3 \text{Exchange rate}_{i,t} + \\ & \beta_4 \text{Population growth rate}_{i,t} + \beta_5 \text{HFCE}_{i,tGDP_{i,t}} + \beta_6 \text{GFCE}_{i,tGDP_{i,t}} + \\ & \beta_7 \text{Bank Deposits}_{i,tGDP_{i,t}} + \beta_8 \text{Total Investment}_{i,tGDP_{i,t}} + \beta_9 \text{Unemployment rate}_{i,t} + \\ & \beta_{10} \text{GDP per capita}_{i,tGDP_{i,t}} + \beta_{11} \text{Current Account Balance}_{i,tGDP_{i,t}} + \\ & \beta_{12} \text{Trade openness}_{i,tGDP_{i,t}} + \beta_{13} \text{Exports}_{i,tGDP_{i,t}} + \beta_{14} \text{Imports}_{i,tGDP_{i,t}} + \vartheta_{i,t} + \epsilon_{i,t} \quad (1) \end{aligned}$$

**Panel Data Structure:** The panel dataset has both a time series and a cross sectional dimension, where all cross-section units are observed during the entire time series period. The expression is  $X_{it}, i = 1, \dots, N, t = 1, \dots, T$ .  $T$  is usually small. Because of data availability and continuity, the study will primarily focus on the time- period from 1996 to 2015 for both selected case analyses. The standard static panel model with  $i = 1, \dots, N, t = 1, \dots, T$  is

$$y_{it} = \beta_0 + x'_{it}\beta + \epsilon_{it} \quad (a)$$

$x'_{it}$  is a  $K$  dimensional vector of independent variables, without a const. term,

$\beta_0$  indicates the intercept , independent of  $i$  and  $t$ ;  
 $\beta$ , a  $(k \times 1)$  vector , the slope, independent of  $i$  and  $t$ ;  
 $\epsilon_{it}$  is the error term , varies over  $i$  and  $t$

Individual characteristics may be included with this model and equations can become

$$y_{it} = \beta_0 + x'_{it}\beta_1 + z'_{it}\beta_2 + \epsilon_{it} \quad (b)$$

In panel dataset analysis, there can be two types of problems: endogeneity and auto correlations in the errors. The individual unobserved heterogeneity problem can be solved where  $z_i$  variables are not available. This problem may be captured by  $\alpha_i$  and decomposing  $\epsilon_{it}$  into  $\epsilon_{it} = \alpha_i + U_{it}$ ;  $U_{it}$  has a mean zero is homoscedastic and not serially correlated. In addition, the panel dataset can be distinguished into two different models: fixed effects and random effects models.

In a fixed effects model,  $\alpha_i$  are individual intercepts and  $y_{it} = \alpha_i + X'_{it}\beta + U_{it}$  for given  $N$ . No overall intercept is included in the model and under FE, there does not need to be any consistency because the individual intercept and  $X'_{it}$  are uncorrelated. It must hold that  $E[X_{it}U_{it}] = 0$  and there is  $N-1$  additional parameter for capturing heterogeneity.

In the random effects model.

$$\alpha_i \sim iid(0, \sigma^2_\alpha) \quad y_{it} = \beta_0 + X'_{it}\beta + \alpha_i + U_{it}, U_{it} \sim iid(0, \sigma^2_u) \quad (c)$$

The value of  $\alpha_i$  is specific for an individual  $i$ . The alpha of different individuals is independent and has a mean of zero and their distribution is also assumed to be not far away from normality. The overall mean is captured in  $\beta_0$ ; and  $\alpha_i$  is homoscedastic across individuals and time invariant. Random effects has one additional parameter:  $\sigma^2_\alpha$ ;  $\sigma^2_\alpha$  which contributes to  $corr(\epsilon_{i,s}, \epsilon_{i,t})$  and  $\alpha_i$  determines both  $\epsilon_{i,s}$  and  $\epsilon_{i,t}$ .

A random effects model is consistent as long as  $E[X_{it} \epsilon_{it}] = E[X_{it}(\alpha_i + U_{it})] = 0$ , i.e  $X_{it}$  are uncorrelated with  $\alpha_i$  and  $U_{it}$ , the independent variables are exogenous and the estimations are consistent. STATA software used for panel data analysis.

#### 4. Results and Discussion

To substantiate among substantive models' different methodical and rigorous approaches have taken in actions. Firstly, panel data has tested its reliability and validity. In term of reliability; stationary or non-stationary, unit roots and co-integration tests are performed. Likely, correlations, heteroscedasticity or homoscedasticity tests verified the validity of the models. Intently, issues need to be resolved, whether or not pooled OLS regression model, random effects model or the fixed effects model is consummate to depict the results. Indeed, verifications confirm homoscedastic or heteroscedastic characteristics data structure as well apt to array either the cross-section or Driscoll and Kraay's fixed effects model to expiate circumstances. To ascertain this, the joint significance of the cross- section and/ or period dummy variables in the fixed effects specification is tested. In case of upper middle-income countries, serial correlation test shows that result has auto-correlation problems and Pesaran CD tests confirm that outcome. Consequently, the fixed effects model is inappropriate to explain the results. However, Driscoll and Kraay's fixed model can resolve the serial correlation and heterogeneity problems. Using Driscoll and Kraay's models result reveals in Table-1. Meantime, in case of lower middle-come countries, the Wooldridge serial correlation test shows that model has no serial correlation and top off Pesaran CD tests confirm it. However, in this case Hausman and Lagrange LM tests' reveals that fixed effects model is appropriate and result depicts in Table-2.

In table 1, Driscoll and Kraay fixed effects model reveals that some factors have strong and significant relationship with ODA. Outcome shows that among the selected factors; GDP per capita growth rate, GFCE, Bank deposit and lending interest rate has significant variation. The elasticity of ODA with respect to GDP per capita growth rate is around 0.058, implies that per unit increase in GDP per capita growth rate increase 5.8 per cent flow of ODA. The level of variation exposes that donors can commemorate the growth rate of a country and approach with proffer. Indeed, implicitly can argue that economic growth has significant influence to attract ODA. However, opposite views can take into account that developing countries look for ODA to boost economic growth or welfare contribution which support Svensson (1998) findings. The elasticity of ODA with respect to lending interest rate is 0.00857, implies that per unit increase in lending interest rate increase ODA flow about 1 per cent. Though the level of variation is not strong but limn a great monetary signal that both have significant relationship. However, there may have diverse and confounded externalities of lending inter rate, but one thang is explicit that lending interest rate depicts a signal for contributors to move forward. Equivocally, it's true that recipients step up to control their money market and absorb ODA. The elasticity of ODA with respect to GFCE is about 0.09411, which illustrates that per unit increase in GFCE increase 9.411 per cent of ODA to the countries. The result exposes that fiscal policy have impulses to the ODA attractions. Whenever countries follow expenditure strategies to stimulate economy, both parties have bilateral responses and GFCE works as stimuli. And, the elasticity of ODA with respect to bank deposits is around -0.0150, represents that per unit decrease in bank deposits decrease 1.5 per cent flow of ODA to the upper-middle-income countries. The relationship is inversely commensurate and can have significant externalities to money market as well portend to the recipients' countries.

Using panel data fixed effects model in lower middle-income countries result reveals that some factors have significant variation with ODA. Among the selected factors; lending interest rate, bank deposits, current account balance and imports are the key determinants to attract ODA to these countries. The elasticity of ODA with respect to commercial lending interest rate is 0.0592, implies that per unit increase in lending interest rate increase 5.92 per cent of ODA. In terms of interaction and significance levels, lower middle-income countries have stronger relationship with lending interest rate than upper-middle income countries. The implicit meaning is that monetary responses trigger to attract ODA. However, explicitly exposes the mismanagement of money market and acts as a stimulus to look for ODA by beneficiaries. The variation of ODA with respect to bank deposits is around -0.0675, explicate that per unit decrease in bank deposits decrease 6.75 per cent of ODA. Apparently, result looks like upper-middle income countries, but interaction exposes stronger and has significant nexus. Indeed, it portrays an egregious money management in lower middle-income countries. Conversely, donor's demeanour discloses in morass by this proposition. The elasticity of ODA with respect to current account balance is about 0.011, exposes that per unit surplus increase 11 per cent of ODA towards the countries. The surplus has aficionado externalities towards ODA and deficit may have vice versa association. The surplus also indicates latent boon to the donors. Finally, the variation of ODA with respect to imports is 0.0421, represents that per unit increase of imports increase 4.21 per cent of ODA to the countries. The result signifies that instead of exports, donor's eye ball is in imports. As long as donors bi or multilateral strive or covet are fulfil in different ways, interest remain germane. Equally, it also true that beneficiaries are bent to resolute their demand by pursue their motive and want to integrate them with wider economies.

**Table 1: Result of ODA for all selected upper-middle-income countries from 1996 to 2015**

	(1.1A)	(1.1B)	(1.1C*)	(1.1D*)	(1.1E*)	(1.1F*)
	<i>Pooled OLS</i>	<i>Random Effect</i>	<i>Fixed Effect</i>	<i>Fixed Effect D&amp;K</i>	<i>Fixed Effect D&amp;K</i>	<i>Fixed Effect D&amp;K</i>
Independent Variables	ODA	ODA	ODA	ODA	ODA	ODA
Lending Interest Rate	0.01165*** (0.00406)	0.00865*** (0.00334)	0.00874** (0.00338)	0.00820** (0.00333)	0.00815** (0.00334)	0.00857** (0.00335)
Inflation	0.00045 (0.00040)	0.00044 (0.00033)	0.00044 (0.00033)	0.00049 (0.00033)	0.00051 (0.00033)	0.00046 (0.00033)
Exchange Rate	0.00000 (0.00002)	-0.00001 (0.00003)	-0.00001 (0.00003)	-0.00001 (0.00003)	-0.00001 (0.00003)	-0.00000 (0.00003)
GDP Per Capita GR	0.08645*** (0.02160)	0.05910*** (0.01686)	0.05837*** (0.01693)	0.05831*** (0.01684)	0.05706*** (0.01686)	0.05859*** (0.01682)
HFCE	0.01748 (0.01083)	0.01015 (0.01147)	0.00597 (0.01203)	0.01258 (0.00969)	0.01518 (0.00984)	0.00798 (0.01017)
GFCE	0.02169 (0.02115)	0.08176*** (0.02589)	0.09285*** (0.02729)	0.09453*** (0.02721)	0.09251*** (0.02714)	0.09411*** (0.02706)
Trade Openness	0.03820** (0.01866)	0.00837 (0.01419)	0.00618 (0.01421)	-0.00655 (0.00473)		
Bank Deposit	-0.00555* (0.00285)	-0.01161*** (0.00398)	-0.01410*** (0.00432)	-0.01421*** (0.00431)	-0.01500*** (0.00422)	-0.01389*** (0.00428)
Current Account Balance	0.01723 (0.01566)	0.00657 (0.01400)	0.00585 (0.01429)	0.00021 (0.01253)	-0.00338 (0.01258)	0.00443 (0.01295)
Unemployment	0.04839*** (0.01549)	0.01241 (0.02793)	0.00511 (0.03137)	0.00349 (0.03122)	0.00449 (0.03130)	0.00441 (0.03120)
Total Investment	0.01909 (0.01632)	-0.02973* (0.01735)	-0.03578* (0.01834)	-0.03157* (0.01764)	-0.03151* (0.01790)	-0.03394* (0.01732)
Imports	0.02560 (0.01827)	-0.00022 (0.01362)	-0.00232 (0.01363)		-0.00905 (0.00834)	
Exports	-0.08088*** (0.02817)	-0.02543 (0.02245)	-0.02394 (0.02254)			-0.01499* (0.00887)
Constant	-2.43075** (1.14508)	0.41535 (1.18089)	1.03842 (1.18450)	0.52479 (1.05541)	0.27379 (1.04072)	0.90090 (1.10271)
Observations	400	400	400	400	400	400
R-squared	0.27128		0.22071	0.21831	0.21674	0.22029
Number of ID		20	20	20	20	20

Standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

1.1C\*= Selected Model to Explain the Result

1.1D\*-1.1F\*= After Correlations tests of Trade Openness, Export and Import

**Table 2: Result of ODA for all selected lower-middle-income countries from 1996 to 2015**

	(2.1A)	(2.1B)	(2.1C*)	(2.1D*)	(2.1E*)	(2.1F*)
	<i>Pooled OLS</i>	<i>Random Effect</i>	<i>Fixed Effect</i>	<i>Fixed Effect</i>	<i>Fixed Effect</i>	<i>Fixed Effect</i>
Independent Variables	ODA	ODA	ODA	ODA	ODA	ODA
Lending Interest Rate	0.01798 (0.02379)	0.06137*** (0.02028)	0.06057*** (0.02026)	0.06028*** (0.02046)	0.06132*** (0.02024)	0.05928*** (0.02051)
Inflation	0.01856 (0.01802)	-0.01515 (0.01448)	-0.01583 (0.01447)	-0.01766 (0.01460)	-0.01640 (0.01423)	-0.01552 (0.01462)
Exchange Rate	-0.00024*** (0.00005)	-0.00028*** (0.00009)	-0.00025** (0.00011)	-0.00023** (0.00011)	-0.00026** (0.00011)	-0.00021* (0.00011)
GDP Per Capita GR	-0.09122* (0.04895)	-0.06684* (0.03483)	-0.06747* (0.03456)	-0.08124** (0.03380)	-0.08046** (0.03347)	-0.08261** (0.03402)
HFCE	-0.03692 (0.02874)	-0.05739*** (0.02144)	-0.05990*** (0.02145)	-0.03504** (0.01723)	-0.03933** (0.01598)	-0.03716* (0.01891)
GFCE	0.31549*** (0.05809)	-0.04659 (0.06125)	-0.10116 (0.06395)	-0.10306 (0.06362)	-0.08694 (0.06327)	-0.10572* (0.06396)
Trade Openness	0.07990** (0.03737)	0.04603 (0.02993)	0.04005 (0.03019)	0.01216 (0.00820)		
Bank Deposit	-0.06521*** (0.01111)	-0.07181*** (0.01679)	-0.06650*** (0.01863)	-0.06171*** (0.01872)	-0.06753*** (0.01843)	-0.05798*** (0.01868)
Current Account Balance	0.06570** (0.02542)	0.10269*** (0.01888)	0.10571*** (0.01879)	0.11106*** (0.01890)	0.10703*** (0.01877)	0.11170*** (0.01894)
Unemployment	-0.27238*** (0.04983)	-0.00010 (0.07865)	0.04177 (0.08653)	0.04732 (0.08737)	0.03869 (0.08615)	0.05673 (0.08749)
Total Investment	0.02311 (0.03885)	-0.01129 (0.03594)	-0.01749 (0.03657)	0.02563 (0.03119)	0.01094 (0.03130)	0.03062 (0.03170)
Imports	0.05884** (0.02495)	0.04078** (0.01740)	0.03601** (0.01731)		0.04211*** (0.01367)	
Exports	-0.12953** (0.05874)	-0.07815 (0.04953)	-0.07397 (0.04983)			0.01052 (0.01459)
Constant	-0.39585 (3.09951)	7.41638*** (2.60895)	8.48190*** (2.56391)	6.22902*** (2.24335)	6.39618*** (2.07759)	6.64722*** (2.40404)
Observations	400	400	400	400	400	400
R-squared	0.55381		0.27246	0.25354	0.26797	0.25014
Number of ID		20	20	20	20	20

Standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

2.1C\*= Selected Model to Explain the Result

2.1D\*-2.1F\*= After Correlations tests of Trade Openness, Export and Import

Results for both upper and lower-middle-income countries is bit different in term of variations, factors, and significance levels. In upper-middle-income countries, among selected factors few determinants have significant and positive variations e.g. GDP per capita growth rate, GFCE and lending interest rate with ODA. In contrast, bank deposits have a significant but negative nexus with ODA. Meantime, in lower-middle countries lending interest rate, imports and current account balance have a significant and positive variation with ODA but has a significant and negative association with bank deposits. By comparing the variation and significance levels in both cases, study reveals that few determinants have more systematic and dynamic impact on ODA in lower-middle-income than upper-middle-income countries. However, two things are prevailing for both cases is that increase in lending

interest rate increases ODA and decrease in bank deposits reduces flow of ODA which signifies upheaval towards all countries.

## 5. Conclusion and Recommendations

Findings broadly confirm the study hypothesis regarding the macroeconomic determinants of ODA in the developing countries. The substantive and integral outcome is that interactions of macroeconomics factors towards ODA is superior in lower-middle-income countries than upper-middle-income. However, few factors (e.g. bank deposits and current account balance) out of monetary and fiscal policies has indispensable impact towards ODA in both cases. Phillips & Perron unit root test has reckoned as a benchmark and panel data co-integration test reveals that few factors have long-run association with ODA. Study finding is significant and integrate money management and trade balance out of fiscal and monetary policies which need to incur into implementations strategies. However, theoretical perspectives of ODA's are to motivate investment, create employments and create long term futuristic opportunity to harmonious growth for posterity, but reality is; most hypothetically selected determinants does not act as a significant synergy force to motivate the ODA flows. Indeed, results have some level of disparity in both cases, but two thinks make indispensable consensus and that is monetary and money market have inverse connotations with ODA. Based on the findings, the study proposed the following acceptance and commitment policy (ACP) which can mitigate the raising problems.

- Despite the extant of inherent myopic problems in developing countries, government need to critically examine the merit level of ODA and give priority to that ODA which can create value added economy and long-term sustainable growth. Exhorting long-term portfolio policy to mitigate short-term money market risks.
- Utmost preferences need to proffer in case of established fiscal and monetary institutions and prescribe time variant policy. Policy maker strongly need to scrutinise the ODA behaviours towards private investment which can discourage local investment and hence, governments to bring the balance of act to reduce ambiguity.
- Appropriate resource allocations by purview the time varying economic diversification. Technological integration and balanced policy response can sooth extraneous externalities.

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## Appendices

### Appendix 1:

#### Lower Middle-Income Countries (20)

Bangladesh, India, Pakistan, Sri-Lanka, Bhutan, The Philippine, Indonesia, Vietnam, Nigeria, Tanzania, Kenya, Tajikistan, Egypt, Sudan, Morocco, Paraguay, Bolivia, Cameroon, Ghana and Papua New Guinea.

#### Upper Middle-Income Countries (20)

Malaysia, Thailand, China, South Africa, Angola, Brazil, Mexico, Peru, Colombia, Dominican Republic, Ecuador, Bulgaria, Romania, Algeria, Turkey, Albania, Turkmenistan, Kazakhstan, Lebanon and Tunisia.

### Appendix 2: Data Source

Dependent Variable FDI (% of GDP)	Data Source	Observation Time
Independent	World Bank	1980-2015
Lending Interest rate (Average Commercial Lending rate)	Central Bank and IBRD	1980 to 2015
Inflation (CPI=Consumer Price Index)	IMF and World Bank	Same
Exchange rate (Yearly Averaged against \$)	World Bank online data	Same
GDPPGR (Annual %)	World Bank	Same
HHFC (% GDP)	World Bank	Same
GFCE (% GDP)	World Bank	Same
Trade Openness (%GDP)	World Bank	Same
Bank Deposit (% of GDP; Demand, time and savings deposits)	World Bank	Same
Current Account Balance (% GDP)	World Bank	Same
Unemployment (% total labor force)	World Bank	Same
Total Investment (% of GDP)	World Bank	Same
Imports (% GDP)	World Bank	Same
Exports (% GDP)	World Bank	Same

### Appendix-3: Hausman Test for Upper-Middle-Income Countries

. hausman fe re

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) fe	(B) re		
Inrate	.0087379	.0086484	.0000895	.0004854
Inflation	.0004432	.0004438	-5.94e-07	.0000551
Exrate	-5.32e-06	-8.36e-06	3.04e-06	.0000155
PopGR	-.2422538	-.229467	-.0127868	.0469763
GDPPGR	.0583704	.0590964	-.0007259	.0015245
HFCE	.0059683	.0101503	-.0041819	.0036278
GFCE	.0928529	.0817557	.0110972	.0086197
TradeOpen	.0061789	.0083691	-.0021902	.00079
BankDeposit	-.014098	-.0116122	-.0024858	.0016744
CAB	.0058547	.0065651	-.0007103	.0028526
Unemployment	.0051148	.0124112	-.0072963	.0142767
TotalInves~t	-.0357793	-.029734	-.0060453	.0059464
Imports	-.0023241	-.000215	-.0021091	.0005552
Exports	-.0239378	-.0254311	.0014932	.0020353

b = consistent under Ho and Ha; obtained from xtreg  
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(14) = (b-B)'[(V\_b-V\_B)^(-1)](b-B)  
 = 29.81  
 Prob>chi2 = 0.0081  
 (V\_b-V\_B is not positive definite)

#### Appendix-4: Bruesch and Pagan Lagrangian multiplier test for random effects in Upper-Middle-Income Countries.

```
. quietly xtreg $y1list $x1list, re
. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

ODA[ID,t] = Xb + u[ID] + e[ID,t]

Estimated results:

```

	Var	sd = sqrt(Var)
ODA	3.565972	1.888378
e	1.404102	1.184948
u	2.025777	1.423298

```

Test:   Var(u) = 0
        chibar2(01) = 483.75
        Prob > chibar2 = 0.0000

```

#### Appendix 5: Tests for Upper Middle-Income Countries

```

Pesaran's test of cross sectional independence = 2.611, Pr = 0.0090

Average absolute value of the off-diagonal elements = 0.412

. xtserial $f1list $a1list

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F( 1, 19) = 544.220
Prob > F = 0.0000

. xtdolshm $f1list $a1list

DOLS Hom. Panel data Coint. Estimation results
Group variable: ID
Wald chi2(12) = 89.64
Prob > chi2 = 0.000

Number of obs = 320
Number of groups = 20
Obs per group: min = 20
                avg = 20
                max = 20
R-squared = 0.5267
Adj R-squared = -0.3652

```

**Appendix 6: Tests for Lower Middle-Income Countries**

Pesaran's test of cross sectional independence = -1.775, Pr = 0.0758

Average absolute value of the off-diagonal elements = 0.404

. xtserial \$ellist \$allist

Wooldridge test for autocorrelation in panel data

H0: no first-order autocorrelation

F( 1, 19) = 17.119

Prob > F = 0.0006

. xtdolshm \$ellist \$allist

DOLS Hom. Panel data Coint. Estimation results	Number of obs	=	320
Group variable: ID	Number of groups	=	20
Wald chi2(12) = 98.40	Obs per group: min	=	20
Prob > chi2 = 0.000	avg	=	20
	max	=	20
	R-squared	=	0.4589
	Adj R-squared	=	-0.6212