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Corruption, aid volatility & growth

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Abstract

This paper revisits the debate on foreign aid effectiveness from a different perspective by analysing the role of institutional corruption on the effect of aid volatility on the output of developing nations. A simple political economy model is developed to show the effect of corruption on rent-seeking activities of incumbent legislators and their subsequent effect on country output. This phenomenon is empirically tested using data on 77 aid-receiving countries from the span of 1984 to 2007 using GMM to control for potential endogeneity.

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1. Introduction

Most studies of foreign aid have attended to the question of whether aid facilitates or hinders economic growth in LDCs. Contradictory empirical answers to this question has led to a focus on volatility in the disbursal of foreign aid and its impact on economic growth (see Fielding & Mavrotas 2006, Lensink & Morrissey 2000, Hudson & Mosely 2008, Neandis & Varvarigos 2007, Bulir & Hamann 2003, Arellano et. al 2009).

Of late, work on aid uncertainty and growth has become increasingly more nuanced. The effect of aid uncertainty on the link between foreign aid and the survival function of incumbent leaders (Heinrich & Kobayashi, 2013) contributes to our understanding of the political economy effects of aid uncertainty on leadership stability. The impact of aid uncertainty on private investment in West Africa has been the subject of a recent paper (Uneze, 2012). The author concludes that uncertainty has a negative impact on private investment and thus reduces the impact of foreign on growth. Houndonougbo's (2012) results suggest that for aid-dependent countries aid uncertainty has severe flow-on effects on the business-cycle by increasing its volatility, while (Kangoye, 2011) revisits the debate on foreign aid effectiveness by presenting empirical evidence to show that higher aid volatility is associated poorer governance.

Although research on aid volatility is a valuable advance on previous work, there has been scant attention paid to other potentially important factors that may affect an aid-recipient's output: the interactions between a potentially corrupt legislator and volatile aid flows in the context of a political economy structure. The role of institutional corruption in the *allocation* of (volatile) aid disbursements has been largely absent from studies on aid volatility and growth. This paper seeks to contribute to the redress of this kind of oversight by examining the political economy mechanism of the aid allocating behavior of recipient governments in the receipt of volatile aid and the effect this subsequently has on output.

The rest of the paper is organized as follows; Section 2 presents a simple political economy mechanism for the transmission of aid volatility to output and the role of corruption in this relationship; Section 3 empirically tests the key Propositions of the model while Section 4 concludes.

2. Model

The government receives foreign aid A which it allocates to public investment k and income transfers to households T. It is assumed that both of these expenditures are exclusively financed by aid donations. Output is determined by $Y = Y(k, K)$, where K is private investment. The amount of aid that remains after allocation to public investment and transfers is $A - k - T$. Households apportion a fraction of this remaining amount φ to private investment. The amount of private investment allocated by households is φT, where $0 \le \varphi \le 1$. Further, it is assumed that the economy's output is subject to the following relationships: $\frac{\partial Y}{\partial k}, \frac{\partial Y}{\partial K} > 0$ and $\frac{\partial^2 Y}{\partial k^2}, \frac{\partial^2 Y}{\partial K^2} < 0$. Aid receipts are conceptualized as follows. Donations are stochastic such that $A = \left\{ \begin{matrix} p(x_0 + x) \\ (1-p)(x_0 - x) \end{matrix} \right\}$, where p is the probability of receiving "high" aid and $(1-p)$ the probability of receiving "low" aid. x_0 is the amount of officially promised aid and x acts as a measure of volatility.

The government consumes the amount $A-k-T$ and obtains utility $u(A-k-T)$, where u is an increasing and concave utility function. The third derivative of the government's utility function with respect to public investment and transfers is assumed to be positive ($u_{kkk}, u_{TTT} > 0$). That is, the government is assumed to be a prudent agent. The amount consumed by the government $A-k-T$ is treated as corrupt expenditure.[1] The government's expected payoff from corrupt expenditure is given by

$$E[u(A-k-T)] = p\left[u(x_0+x-k-T)\right] + (1-p)\left[u(x_0-x-k-T)\right]$$

The government, however, faces a trade-off between maximizing its expected utility from corrupt expenditure and being removed from office. It is assumed that the government can increase its chances of staying in office by increasing the nation-state's output and thereby improving the citizenry's welfare, determined by a citizenry utility function $u^p\left(Y(k,\varphi T)+(1-\varphi)T\right)$. Citizenry utility is a function of household consumption, which is increasing in output $Y(k,\varphi T)$ and the fraction of transfers consumed $(1-\varphi)T$. It is assumed that the citizens' utility function is concave in all arguments. It is further assumed that the government possesses a specific propensity for engaging in corrupt expenditure, denoted by α. This propensity weights the trade-off between corrupt expenditure and citizenry welfare.

The government's propensity to engage in corrupt behavior is assumed to be positively related to the nation-state's institutional corruption – the latter being defined as a lack of 'checks and balances' on government decision-making such as corruption commissions, freedom and independence of the press, freedom and independence of universities, independence and impartiality of the judicial system, democratic accountability, clear property rights and so on. The government's propensity for corruption is a function of institutional corruption z. The parameter z is determined by cultural, political, psychological factors, which are exogenous to the model. We denote $\alpha = \alpha(z)$, where $\alpha_z(z) > 0, \alpha_{zz}(z) < 0$ and $0 \le \alpha(z) \le 1$. The propensity for corruption, $\alpha(z)$, weighs the trade-off between the welfare of the people and the government's self-consumption. The closer $\alpha(z)$ is to 1, the greater is the government's propensity for self-consumption and conversely, the closer $\alpha(z)$ is to 0, the smaller is the government's propensity for self-consumption.

Thus, the government solves the following problem:

$$\begin{aligned}
&\max_{k,T}\{\left[1-\alpha(z)\right]\left[u^p\left(Y(k,\varphi T)+(1-\varphi)T\right)\right]+\alpha(z)E\left[u(A-k-T)\right]\} \\
&=\max_{k,T}\{\left[1-\alpha(z)\right]\left[u^p\left(Y(k,\varphi T)+(1-\varphi)T\right)\right] \\
&+\alpha(z)\left[p\left(u(x_0+x-k-T)\right)+(1-p)\left(u(x_0-x-k-T)\right)\right]\} \qquad (1)
\end{aligned}$$

[1] Corrupt expenditure is characterized by bribery, vote-buying, bolstering public servant salaries, pork barrelling, corrupt campaign financing, etc.

The first order conditions are (optimized variables are asterisked):[2]

$$\left[1-\alpha(z)\right]Y_k(k^*,\varphi T)\left[u_k^p\left(Y(k^*,\varphi T)+(1-\varphi)T\right)\right]$$
$$+\alpha(z)\left[p\left(u_k(x_0+x-k-T)\right)(-1)+(1-p)\left(u_k(x_0-x-k-T)\right)(-1)\right]=0 \quad (2)$$

$$\left[1-\alpha(z)\right]\left[\left(\varphi Y_T(k,\varphi T^*)+(1-\varphi)\right)u_T^p\left(Y(k,\varphi T^*)+(1-\varphi)T^*\right)\right]$$
$$+\alpha(z)\left[p\left(u_T(x_0+x-k-T^*)\right)(-1)+(1-p)\left(u_T(x_0-x-k-T^*)\right)(-1)\right]=0 \quad (3)$$

Proposition 1:

As aid volatility (x) increases, the government's optimal public investment (k^*) and optimal transfer payments (T^*) also decrease.

Proof:

Taking the derivative of (2) with respect to aid volatility x yields:

$$\frac{\partial k^*}{\partial x}=k_x^*=\frac{-\left[p\left(u_{kx}(C^{H_k})\right)+(p-1)\left(u_{kx}(C^{L_k})\right)\right]}{-\left[p\left(u_{kx}(C^{H_k})\right)-(p-1)\left(u_{kx}(C^{L_k})\right)\right]+\left\{\frac{\left[1-\alpha(z)\right]}{\alpha(z)}\Psi_{kx}\right\}} \quad (4)$$

Similarly, finding the derivative of equation (3) with respect to transfers yields:

$$\frac{\partial T^*}{\partial x}=T_x^*=\frac{-\left[p\left(u_{Tx}(C^{H_T})\right)+(p-1)\left(u_{Tx}(C^{L_T})\right)\right]}{-\left[p\left(u_{Tx}(C^{H_T})\right)-(p-1)\left(u_{Tx}(C^{L_T})\right)\right]+\left\{-\frac{\left[1-\alpha(z)\right]}{\alpha(z)}\Psi_{Tx}\right\}} \quad (5)$$

where,

$$\Psi_{kx}=\begin{bmatrix} Y_{kx}(k^*,\varphi T)\left[u_k^p\left(Y(k^*,\varphi T)+(1-\varphi)T\right)\right] \\ +\left(Y_k(k^*,\varphi T)\right)^2\left[u_{kx}^p\left(Y(k^*,\varphi T)+(1-\varphi)T\right)\right]\end{bmatrix},$$

$$\Psi_{Tx}=\begin{bmatrix} \varphi Y_{Tx}(k,\varphi T^*)\left[u_T^p\left(Y(k,\varphi T^*)+(1-\varphi)T^*\right)\right] \\ +\left(\varphi Y_T(k,\varphi T^*)+(1-\varphi)\right)^2\left[u_{Tx}^p\left(Y(k,\varphi T^*)+(1-\varphi)T^*\right)\right]\end{bmatrix},$$

$C^{L_T}\equiv x_0-x-k-T^*$ and $C^{H_T}\equiv x_0+x-k-T^*$; $C^{H_k}\equiv x_0+x-k^*-T$ and $C^{L_k}\equiv x_0-x-k^*-T$.

[2] u_k is the derivative of the government utility function with respect to public investment k while u_k^p is the derivative of the citizen's utility with respect to public investment k.

u_{kx} and u_{Tx} denote the second order partial derivatives of the government's utility function with respect to public investment and aid volatility and transfers and aid volatility, respectively. Ψ_{kx} and Ψ_{Tx} are second order partial derivatives of citizenry utility with respect to public investment and aid volatility and transfers and aid volatility, respectively. C denotes the consumption which remains after the allocation of public investment and transfers by the government; the superscripts L_T and H_T refer to "low" aid (L) and "high" aid (H) channeled into income transfers, respectively, while the superscripts L_k and H_k refer to "low" aid (L) and "high" aid (H) channeled into public investment k, respectively.

Assuming a prudent government (i.e. whose utility function possesses the following properties: $u_{kx}(C^{H_k}) > u_{kx}(C^{L_k}), u_{Tx}(C^{H_T}) > u_{Tx}(C^{L_T})$), and given the assumptions on the government's second order partial derivatives, which imply $\left[p\left(u_{kx}(C^{H_k})\right)-(p-1)\left(u_{kx}(C^{L_k})\right)\right]$, $\left[p\left(u_{Tx}(C^{H_T})\right)-(p-1)\left(u_{Tx}(C^{L_T})\right)\right]<0$, and assuming $Y_{kk}Y_{TT}<0$, since $\left[p\left(u_{kx}(C^{H_k})\right)+(p-1)\left(u_{kx}(C^{L_k})\right)\right],\left[p\left(u_{Tx}(C^{H_T})\right)+(p-1)\left(u_{Tx}(C^{L_T})\right)\right]>0$ $\Psi_{kx},\Psi_{Tx},<0$, we conclude that $k_x^*, T_x^* < 0$ $\square$

Higher aid volatility increases aid uncertainty. Given the level of institutional corruption, an increase in aid uncertainty makes it more difficult for the nation-state's institutions to detect and monitor the government's finances. Thus, given the propensity for corrupt behavior, a government siphons aid for corrupt expenditure to a greater extent than would otherwise be the case in the absence of an increase in aid volatility. A corollary is that the optimal level of public investment and transfers expenditure decreases to accommodate increased corrupt consumption.

Proposition 2:

As the nation-state's institutional corruption (z) increases, the negative impact of increasing aid volatility (x) on optimal public capital investment (k_x^*) and optimal transfers (T_x^*) is exacerbated.

Proof:

For notational ease, let:

$$\left[p\left(u_{kx}(C^{H_k})\right)+(p-1)\left(u_{kx}(C^{L_k})\right)\right]=\Phi_{kx};\ \left[p\left(u_{kx}(C^{L_k})\right)-(p-1)\left(u_{kx}(C^{H_k})\right)\right]=\Gamma_{kx} \text{ and}$$

$$\left[p\left(u_{Tx}(C^{H_T})\right)+(p-1)\left(u_{Tx}(C^{L_T})\right)\right]=\Phi_{Tx};\ \left[p\left(u_{Tx}(C^{L_T})\right)-(p-1)\left(u_{Tx}(C^{H_T})\right)\right]=\Gamma_{kx}$$

Differentiating equation (4) and (5) with respect to institutional corruption z we obtain:

$$\frac{\partial k_x^*}{\partial z} = k_{xz}^* = \frac{2\alpha_z(z)\Phi_{kx}\Psi_{kx}}{\left[\Gamma_{kx} + \left(\frac{2[1-\alpha(z)]}{\alpha(z)}\right)\Psi_{kx}\right]^2 [\alpha(z)]^2}, \quad \frac{\partial T_x^*}{\partial z} = T_{xz}^* = \frac{2\alpha_z(z)\Phi_{Tx}\Psi_{Tx}}{\left[\Gamma_{Tx} + \left(\frac{2[1-\alpha(z)]}{\alpha(z)}\right)\Psi_{Tx}\right]^2 [\alpha(z)]^2}$$

where, k_x^* and k_T^* are the derivatives of public investment and income transfers with respect to aid volatility, respectively. Since $\Phi_{kx}, \Phi_{Tx}, \alpha_z(z) > 0$ and $\Psi_{kx}, \Psi_{Tx} < 0$ we can say that $k_{xz}^*, T_{xz}^* < 0$ □

An increase in the institutional corruption provides a greater opportunity for the government to further misappropriate aid. In an environment in which weaker checks and balances exist on the government's activities, potential misappropriated aid is redirected to corrupt consumption.

Proposition 3:

Given propositions 1 and 2, output (Y) is negatively related to volatility (x).

Proof:

Recall the assumptions $Y_k, Y_K > 0$, which denote that output increases (decreases) as public investment and private investment increase (decrease). Noting $K^* = \varphi T^*$, the result of proposition 1, $T_x^* < 0$, implies $K_x^* < 0$. Thus, $K_x^* < 0$ and $k_x^* < 0$ imply $Y_x^* < 0$. □

Proposition 4:

Given the proof of proposition 3, an increase in the nation-state's institutional corruption (z) exacerbates the negative marginal impact of aid volatility (x) on output (Y).
Proof:

From proof of proposition 2, $T_{xz}^* < 0$ implies $K_{xz}^* < 0$ since $K^* = \varphi T^*$. Given $Y_k, Y_K > 0$ and noting the result of proposition 2, namely, $k_{xz}^* < 0$, it follows that $Y_{xz}^* < 0$. □

3. Empirical Strategy and Evidence

I test propositions 3 and 4 by utilizing panel data covering 77 countries over the period 1984-2004. The following model is employed:

$$y_{irt} = \alpha_r + \beta_t + \gamma_1 z_{irt} + \gamma_2 v_{irt} + \gamma_3 (z_{irt} \times v_{irt}) + \sum_{j=1}^{k} \delta_j X'_{irt} + \varepsilon_{irt}, \qquad (6)$$

where y_{irt} is average annual growth per capita GDP in country i in region r averaged over $t-2$ years to t, α_r is a regional dummy variable for four regions of the world, which controls for regional fixed effects, β_t is a variable capturing time varying shocks, z_{irt} is a measure of the nation-state's institutional corruption in country i in region r averaged over $t-2$ years to t, v_{irt} is a measure of aid volatility in country i in region r averaged over $t-2$ years to t, $(z_{irt} \times v_{irt})$ is a measure of the interaction between a nation-state's institutional corruption and aid volatility in country i in region r averaged over $t-2$ years to t and X'_{irt} is a vector of various control variables.

Taking the derivative of the equation above with respect to volatility yields the following point estimate: $\gamma_2 + \gamma_3 z_{irt}$. Our analysis focuses on the coefficients, γ_2 and γ_3. Our theoretical section suggests that γ_2 and γ_3 should be significantly negative.

We construct an institutional corruption variable by using two indicators measuring economic risk: i) democratic accountability (sourced from ICRG); and ii) political rights (sourced from Freedom House).[3] To compute z we first subtract the realized values of democratic accountability and political rights for each country over every time period from the highest possible measure (which in both cases is seven). We then take equal weights of these residual measures to construct a composite index of institutional corruption. Democratic accountability measures the degree to which the nation-state's institutions, are accountable to the public, have the ability to conduct free and fair elections for the legislature, consist of an independent judiciary, and so on. Political rights measures the degree of voting autonomy for minority groups, political competition, and political recourse for all citizens, etc.

The dependent variable in our study is average annual growth per capital GDP. Real GDP per capita is used to compute an annualized average growth rate according to $\frac{1}{2}[\ln(y_t) - \ln(y_{t-2})]$. Though it is standard practice in cross-country growth regressions to utilize 5 year lags, since our study comprises of 24 observations per group, using 5 year lags to compute the growth rate would lead to observation loss of 3 per group. Thus, we use 2 year lags for computing the growth rate in order to maximize the number of observations present for regression analyses.

A benchmark model is estimated using OLS and General Method of Moments (GMM). The latter helps overcome the problem of endogeneity between the set of cross-country independent variables and other country specific characteristics. It is also appropriate to utilize the GMM estimators when: i) there are more moment conditions than model parameters; and ii) the panel dataset consists of a large country dimension relative to a smaller time dimension[4]. Both are characteristics of the dataset used in this study. We employ the following specification tests to support out main hypothesis:

i) Instrument validity by using Hansen's J statistic of over-identifying restrictions[5].
ii) Arellano & Bond (1991) AR (1) & AR (2) tests for first and second order serial autocorrelation.

[3] Democratic accountability measures the degree to which the nation-state's institutions, are accountable to the public, have the ability to conduct free and fair elections for the legislature, consist of an independent judiciary, and so on. Political rights measures the degree of voting autonomy for minority groups, political competition, and political recourse for all citizens, etc.

[4] If the time dimension is large, then dynamic panel bias becomes insignificant – in such a case, a fixed estimator is recommended (see Roodman 2006). Further, as the time dimension of the panel increases, the number of instruments in the GMM-SYS and GMM-DIFF tends to explode; additionally, as the cross-sectional dimension increases, the Arellano-Bond autocorrelation test may become unreliable.

[5] The Hansen's J statistic is used in place of the Sargan test of over-identifying restrictions because of its consistency in the presence of autocorrelation and heteroscedasticity (Neanidis & Varvarigos, 2009; Roodman, 2007). We make sure we check whether deeper lags of the instrumented variables are correlated with deeper lags of the disturbances.

Table 1 shows the results of equation (6).

Table 1: Impact of Interaction Effects on Growth
(Dependent Variable is Average Annual Growth of Per Capita GDP)

	(1) OLS	(2) OLS	(5) GMM-SYS	(6) GMM-DIFF
Institutional corruption	-0.010^{***} (0.003)	-0.010^{**} (0.022)	-0.010 (0.496)	-0.020 (0.134)
Volatility	-0.100^{***} (0.000)	-0.104^{***} (0.000)	-0.174^{**} (0.021)	-0.153^{**} (0.046)
Corruption x Volatility	-0.030^{***} (0.000)	-0.030^{***} (0.000)	-0.048^{***} (0.003)	-0.038^{**} (0.018)
Investment	-----	0.001^{**} (0.016)	0.002^{*} (0.087)	0.001 (0.731)
Initial GDP per capita (ln)	-----	-0.010^{***} (0.002)	-0.007 (0.161)	-0.040 (0.364)
Aid per capita	-----	0.0001 (0.615)	-0.001 (0.132)	0.0001 (0.943)
Geography		0.042^{**} (0.021)	0.037 (0.633)	-0.057 (0.983)
Life expectancy (ln)		0.100^{***} (0.000)	0.015 (0.201)	0.437^{*} (0.093)
Countries/*N*	77/602	77/568	77/568	77/489
adj. R^2	0.254	0.353		
Number of Instruments			70	60
No. of lags of endogenous Variables			3	4
AR(1) test (*p*-value)			0.000	0.001
AR(2) test (p-value)			0.532	0.819
Chi-square (Hansen J-statistic)			0.282	0.272

Notes: i) p-values in parentheses based on robust standard errors.
ii) Constant term, country and time dummies not reported.
iii) Instrumented variables appear in bold type
iv) ***,** and * represents the significance at 1%, 5% and 10% respectively

The results show that aid volatility is negatively related to growth. The interaction term is negative and strongly significant (at least at the 5 per cent level). This illustrates that a one unit increase in institutional corruption (for a given level of aid volatility) exacerbates the negative impact of volatility on growth. The statistics for the Arellano & Bond (1991) AR (1) & AR (2) tests for first and second order serial autocorrelation do not show evidence of any autocorrelation for AR (2). The Hansen J-statistic for over identifying restrictions implies that a valid instrument set is used for GMM estimations. Table 2 shows the robustness of our baseline regression in the presence of additional covariates. These additional controls are life expectancy, fertility, geography, population, trade share, schooling, ethnic fractionalization, real openness, budget balance, and mortality. In the aid-growth literature, these have been found to have a significant impact on developing country growth (Burnside & Dollar, 2000; Clemens et. al, 2004; Varvarigos & Neanidis, 2009; Arellano et. al, 2009; Lensink & Morrissey, 2006; Rajan & Subramaniam 2008). We note that controlling for additional covariates does not alter the baseline results.

TABLE 2: Impact of Interaction Effects on Growth with Additional Controls, GMM Estimations (Dependent Variable is Average Annual Growth of Per Capita GDP)

	(1) GMM	(2) GMM	(3) GMM	(4) GMM	(5) GMM	(6) GMM	(7) GMM	(8) GMM
Corruption	-0.010 (0.331)	0.004 (0.557)	-0.010 (0.313)	-0.012* (0.071)	-0.005 (0.495)	-0.004 (0.580)	-0.002 (0.847)	-0.006 (0.463)
Uncertainty	-0.172** (0.016)	-0.174** (0.015)	-0.156** (0.046)	-0.117* (0.063)	-0.174** (0.021)	-0.214*** (0.003)	-0.192** (0.026)	-0.183** (0.026)
Corruption x Volatility	-0.046*** (0.003)	-0.049*** (0.002)	-0.044** (0.010)	-0.034*** (0.007)	-0.046*** (0.003)	-0.064*** (0.000)	-0.053*** (0.004)	-0.049*** (0.005)
Investment	0.001* (0.067)	0.002 (0.113)	0.002 (0.129)	0.002** (0.041)	0.002 (0.121)	0.001 (0.350)	0.001 (0.474)	0.002* (0.069)
Initial GDP per capita (ln)	-0.015** (0.011)	-0.008 (0.163)	-0.008 (0.202)	-0.003 (0.557)	-0.008 (0.228)	-0.010 (0.114)	-0.010 (0.225)	-0.007 (0.225)
Aid per capita	0.001 (0.196)	-0.001* (0.079)	-0.0003 (0.679)	-0.0002 (0.746)	-0.001 (0.294)	-0.0002 (0.832)	0.001 (0.244)	0.001 (0.134)
Geography	0.031 (0.965)	0.036 (0.797)	0.022 (0.768)	-0.026 (0.800)	-0.010 (0.853)	0.052 (0.586)	0.056 (0.519)	-0.062 (0.539)
Life expectancy (ln)	0.041*** (0.002)	0.016 (0.222)	0.013 (0.247)	0.010 (0.499)	0.020 (0.127)	0.014 (0.314)	0.023 (0.116)	0.011 (0.401)
Fertility	-0.012*** (0.000)							
Population		-0.078 (0.540)						
Trade Share			0.038** (0.025)					
Schooling				0.0003 (0.198)				
Ethnic Frac					-0.022 (0.489)			
Openness						0.001** (0.020)		
Inflation(ln)							-.010* (0.095)	
M2/GDP								0.001 (0.104)
Countries/*N*	77/491	77/491	77/491	76/360	77/492	77/471	77/460	77/491
Number of Instruments	70	70	70	65	70	70	70	70
No. of lags of endogenous	3	3	3	3	3	3	3	3
AR(1) test (*p*-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000
AR(2) test (*p*-value)	0.631	0.490	0.649	0.958	0.633	0.348	0.250	0.516
Hansen *J*-statistic	0.292	0.343	0.232	0.352	0.574	0.461	0.342	0.171

Notes: i) p-values in parentheses based on robust standard errors.
ii) Constant term, country and time dummies not reported.
iii) Instrumented variables appear in bold type
iv) ***,** and * represents the significance at 1%, 5% and 10% respectively

4. Conclusion & Policy Considerations

We theoretically show how the effect of aid volatility on economic output is influenced by the degree of institutional corruption. Empirically, the relationships between growth and aid volatility and growth and the interaction between aid volatility and institutional corruption are significant, negative and robust to additional covariates. With respect to policy prescriptions, foreign aid would be more effective if aid uncertainty was reduced and the quality of institutions strengthened, in the light of evidence that corruption worsens the negative relationship between aid uncertainty and output. Thus, it would be more wise a practice for international agencies such as the International Monetary Fund (IMF) and The World Bank to take on board a prescriptive aid policy plan for LDCs by incorporating institutional quality into their calculus as a factor of considerable weight.

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