The Impact of Aid on the Fiscal Behaviour of Governments in Transition Economies

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Abstract

This study contributes to the aid-effectiveness literature by applying a fiscal response model to a panel of 24 transition nations over the periods 1990 – 2005. The study employs various dynamic panel estimation methods in an effort to analyze the impact of foreign aid on governments' fiscal behaviour; that is, government investment, government consumption, public revenue creation and borrowing activities. The findings shed some light on the aid-growth nexus, indicating that aid promotes government investment while does not influence government consumption behaviour. Further, there appears to be a positive association between aid and public borrowing, which can be detrimental to the growth process in transition economies.

Keywords: *foreign aid, fiscal response, transition economies, dynamic panel*

JEL Classification: C23, E62, P33, P35

Introduction

There is a lack of consensus in economics on the issue of whether foreign aid constitutes an important channel for economic growth in developing countries. Nevertheless, the empirical studies testing aid-growth relationship directly by "growth accounting" equations have yielded rather mixed results (Rajan and Subramanian, 2005; McGillivray et al., 2006). The frontier of the literature on the subject therefore has shifted towards the question of under what conditions or through which mechanism aid promotes growth (for instances, Burnside and Dollar, 2000; Gomanee, Girma and Morrissey, 2005). In this regard, much attention has recently been given to the fiscal responses of the recipient governments

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to foreign aid. Although there are a great deal of empirical studies focusing on the fiscal impacts of aid for a single developing country, there are few studies on the subject employing a large panel of developing countries (Feeny and McGillivray, 2003; Ouattara, 2006a). Further, despite the fact that there has been a considerable amount of financial assistance flowing into the transition economies since early 1990s, to the best of our knowledge, there is no research examining the aid-growth nexus through fiscal responses to aid in these economies.[1] In an effort to accelerate the transition process from planning to market economies, foreign assistance programmes have been implemented; however, only little is known about impact of these programmes in recipient economies. Given the importance of foreign aid in transition process, the present paper aims to fill this gap in the literature by applying recent dynamic panel techniques to a panel data from 24 transition countries within the framework of a fiscal response model.

The research on the growth-aid interaction has recently started to emphasize on the significance of policy environment at which aid might work its way through promoting growth. For example, a frequently cited study by Burnside and Dollar (2000) presents evidence that only under circumstances of a "good" policy environment in terms of fiscal, monetary and trade policies does aid play a role in enhancing macroeconomic performance. Some subsequent studies such as Collier and Hoeffler (2002) and Collier and Dollar (2002) confirm this result while some others such as Easterly, Levine and Rodman (2004) and Rajan and Subramanian (2005) provide little support for aid-growth link through policy conditions in a recipient country. We do not attempt to resolve the debate in this literature; but raise a perhaps more important question of what factors might lead the recipient countries to implementing "good" policies in the first place. One of the potential factors may be the foreign aid that can provide incentive for these countries to initiate "good" monetary or fiscal policies. If there exists an aid-growth link conditional on policy environment, one should ask whether aid helps governments establish such necessary conditions. Therefore, it seems more reasonable to investigate the aid-growth linkage through its impact on government policy decisions. The studies adopting fiscal response approach originally developed by Heller (1975) can serve for this purpose.

There are voluminous numbers of studies using fiscal response model to investigate the effect of aid for a single developing country with rather mixed results (for examples, Gang and Khan, 1991, for India; Otim, 1996, for Pakistan, India and Sri Lanka; Rodriguez et al., 1998, for Pakistan; Rodriguez, 2000, for Costa Rica; McGillivray and Ouattara, 2005, for Ivory Coast; Mavrotas, 2005,

[1] Transition economies have received financial aid of approximately 3.2% of their gross national products on the average over the sample period of 1990 – 2005 (authors' own calculation).

for Uganda, and Quattara, 2006b, for Senegal). However, cross country studies are relatively few. Using a large panel of developing economies, Feeny and McGillivray (2003) examine the aid-public borrowing relationship and documents that aid stimulates public borrowing. Ouattara (2006a) for a panel of 68 developing countries finds evidence in favor of positive impacts of aid on government fiscal behaviour. More specifically, her findings indicate a positive association between aid and public investment and an inverse one between aid and borrowing while indicate no significant effect of aid on government consumption and revenue. Without explicitly adopting the fiscal response model, few studies seek for transmission mechanisms through which aid influences growth. For instance, Boone (1996) for a panel of 91 countries finds that aid stimulates consumption expenditures while displaces investment. In contrast, Gomanee, Girma and Morrissey (2005) for a panel of 26 Sub-Saharan economies presents support for the presence of an aggregate investment channel operating to spur growth. Although aid-growth linkage through its impact on government behaviour is examined by a limited number of studies for a panel of developing countries, there is no study on the subject giving proper attention to transition economies. The central objective of the present paper, therefore, is to focus on the issue of whether aid brings about a "good" fiscal policy in transition nations using the fiscal response approach.

This paper is organized as the following. Section 1 constructs the theoretical model and lays out the resulting estimating equations. Empirical problems associated with dynamic panel models are discussed in Section 2. Then, section 3 and 4 present respectively the data and the results. The last section concludes.

1. The Model

The theoretical underpinnings of the fiscal response model were originally developed by Heller (1975) and extended by several subsequent studies such as Rodriguez et al. (1998) and Quattara (2006a).[2] Accordingly, the utility function of public sector is defined as the following:

$$U = f\left(G_I, G_C, R, A, B\right) \tag{1}$$

where G_I, , G_C , R, A and B represent public investment, government consumption, public revenue, foreign aid and public borrowing respectively. A representative government that is after utility maximization aims to minimize the following quadratic loss function:

[2] This section largely borrows from the model by Quattara (2006a).

$$U = \alpha_0 - \frac{\alpha_1}{2}\left(G_I - G_I^*\right)^2 - \frac{\alpha_2}{2}\left(G_C - G_C^*\right)^2 - \frac{\alpha_3}{2}\left(R - R^*\right)^2 - \frac{\alpha_4}{2}\left(B - B^*\right)^2$$
$$(\alpha_i > 0, \forall i = 1,...4) \tag{2}$$

subject to the budget constraint given below

$$G_I + G_C = R + A + B \tag{3}$$

where the variables with asterisks are the targeted values of the variables in question. When we minimize the loss function with respect to the budget constraint using a langrangian function and solve for the first order conditions, we can obtain the following semi-reduced equations:

$$G_I = \delta_1 G_I^* + \delta_2\left(A + B^* + R^* - G_C^*\right) \tag{4}$$

$$G_C = \delta_3 G_C^* + \delta_4\left(A + B^* + R^* - G_I^*\right) \tag{5}$$

$$R = \delta_5 G_C^* - \delta_6\left(A + B^* - G_I^* - G_C^*\right) \tag{6}$$

$$B = \delta_7 B^* - \delta_8\left(A + B^* - G_I^* - G_C^*\right) \tag{7}$$

where $\delta_i (i = 1,\ 2,...,8)$ are the combinations of α_i (see for details Quattara, 2006a).

Equations (4 – 7) can be estimated using single equation estimation methods once the unobservable targeted variables are accounted for. However, data on the targets are not available for most of the countries in the sample. The target variables are usually obtained from an AR(1) specification for the variable of interest or cointegration techniques. However, since there is a limited number of a time series observation for each country in this study, we do not make use of these time series techniques. Instead, following the lead of the study by Quattara (2006a) and general consent in the fiscal response literature, we specify economic relationships for each target variable. Differently from Quattara (2006a) however, we include the lagged values of the variable in each equation on grounds that the previous value of the variable in question inevitably influences governments' decision in determining the target for time t and also that governments are likely to adopt an incremental budgeting behaviour (Otim, 1996). In addition it is reasonable to expect that these variables have a high persistence. In light of all that, the target variables are specified as the following.

First, we begin with the assumption that both the targets for government investment and consumption are determined by GDP (Gross Domestic Product) per capita (*Y)*, public debt service (*D*) and aid flows.

$$G_I^* = \gamma_0 + \gamma_1 Y + \gamma_2 D + \gamma_3 A + \gamma_4 G_{It-1} \quad (8)$$

$$G_C^* = \eta_0 + \eta_1 Y + \gamma_2 D + \gamma_3 A + \gamma_4 G_{Ct-1} \quad (9)$$

With higher income per capita, governments are likely to spend more on both consumption and investment. While debt servicing is expected to reduce the amount of government expenditures, foreign aid might result in an increase in these expenditures since governments are provided with more financial resources with foreign aid. Furthermore, the target for government (tax and non-tax) revenue is specified as a function of domestic activities (proxied by GDP per capita) and external activities such as imports (*M*) and exports (*X*).

$$R^* = \mu_0 + \mu_1 Y + \mu_2 X + \mu_3 M + \mu_4 R_{t-1} \quad (10)$$

More revenue can be created with the higher the internal and external activities. Lastly, it is assumed that public borrowing is related to income per capita and financial aid. Foreign aid can either substitute for or stimulates public borrowing.

$$B^* = \varepsilon_0 + \varepsilon_1 Y + \varepsilon_2 A + \varepsilon_3 B_{t-1} \quad (11)$$

Once equations (8 – 11) are plugged into equations (4 – 7), rearranging them yields the following estimating equations that are of fully reduced forms:

$$G_I = \beta_0 + \beta_1 Y + \beta_2 D + \beta_3 A + \beta_4 X + \beta_5 M + \beta_6 G_{It-1} + \beta_7 G_{Ct-1} + \beta_8 R_{t-1} + \beta_9 B_{t-1} \quad (12)$$

$$G_C = \varpi_0 + \varpi_1 Y + \varpi_2 D + \varpi_3 A + \varpi_4 X + \varpi_5 M + \varpi_6 G_{It-1} + \varpi_7 G_{Ct-1} + \varpi_8 R_{t-1} + \varpi_9 B_{t-1} \quad (13)$$

$$R = \psi_0 + \psi_1 Y + \psi_2 D + \psi_3 A + \psi_4 X + \psi_5 M + \psi_6 G_{It-1} + \psi_7 G_{Ct-1} + \psi_8 R_{t-1} + \psi_9 B_{t-1} \quad (14)$$

$$B = \varphi_0 + \varphi_1 Y + \varphi_2 D + \varphi_3 A + \varphi_4 X + \varphi_5 M + \varphi_6 G_{It-1} + \varphi_7 G_{Ct-1} + \varphi_8 R_{t-1} + \varphi_9 B_{t-1} \quad (15)$$

Equations (12 – 15) can be estimated one at a time to see whether aid plays a significant role on these fiscal variables. However, since each of these equations incorporates the lagged values of the dependent variable as a regressor, their estimation with panel data raises important empirical concerns, which is to this we now turn to.

2. Empirical Issues

The estimating equations (12 – 15) are basically of the following form:

$$Y_{i,t} = \alpha_i + \delta_t + \beta Y_{i,t-1} + X_{i,t} \gamma + u_{i,t} \quad (16)$$

where the subscripts $i = 1,\ldots,N$ and $t = 1,\ldots,T$ represent the cross-section and time-series dimension of the panel data; $\mathbf{X}_{i,t}$ is a vector of right hand side variables, α_i and δ_t are cross country and time specific effects, and $u_{i,t}$ is a random disturbance.

A standard estimation method for dynamic panel models is to use the fixed effect specification.[3] However, because of the correlation between the lagged dependent variable and the country specific component, it has been shown that the fixed effect estimator yields downward biased and inconsistent estimates unless time series dimension of a panel goes to infinity (Nickell, 1981; Nerlove, 2000). Since a large time dimension is unlikely to be the case in practice (only 16 observations in this study), a natural step is to address the source of bias and inconsistency. To this end, the most widely employed methods for dynamic panel models are generalized methods of moment (GMM) estimations suggested by Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998). Arellano and Bond (1991) suggests a single equation GMM estimation called difference GMM by first-differencing the model to get rid of country specific effects and then employing the lagged (twice or more) level of the dependent variable as instruments that must possess the requirements for orthogonality conditions. The required moment conditions in this case are the following:

$$E\left[Y_{i,t-j} * \Delta u_{i,t} \right] = 0 \text{ for } j \geq 2; t = 3,...,T \tag{17}$$

$$E\left[X_{i,t-j} * \Delta u_{i,t} \right] = 0 \text{ for } j \geq 2; t = 3,...,T$$

This is to assume that there are no second or higher order serial correlation problem in the errors and the right hand side variables are not correlated with the error term. The difference GMM method however raises a concern. If the dependent variable has a unit root or there is high persistence in the explanatory variables, the lagged levels of the dependent variable will be poor instruments for its first-difference (see for an overview Bond, 2002). Therefore, this study applies the level GMM to equations (12 – 15) by keeping the country specific effects and using the lagged differences of the dependent variable as instruments for its level. The moment conditions in this case are:

$$E\left[\Delta Y_{i,t-j} * u_{i,t} \right] = 0 \text{ for } j \geq 2;\ t = 3,...,T \tag{18}$$

$$E\left[\Delta X_{i,t-j} * u_{i,t} \right] = 0 \text{ for } j \geq 2;\ t = 3,...,T$$

[3] If the country-specific effects are correlated with the regressors, the random effect estimator is inefficient and inconsistent. In dynamic panel models such as equation (16), specific effects and the lagged dependent variable are expected to be correlated. We performed a Hausman test to check if specific effects and the regressors are correlated. The results on this tests are reported at the bottom of Tables 2 – 5. For all sepecifications (equations 12 – 15), we reject the null the hypothesis that country specific effects are uncorrelated with the regressors at any conventional level of significance. As a consequence, random effect estimator is unreliable. In this case, the country specific effects need to be treated as fixed.

However, additional problems related to the use of these single equation GMM estimators arise if the time series dimension of the panel is rather small (only 16 observations in this study). Blundell and Bond (1998) show that the single equation GMM estimator yields inefficient and inconsistent estimates given a small time observations. They suggest to combine the difference GMM and level GMM in a system of equations with the same instruments respectively, and then to use a system GMM estimation. The required additional moment conditions in this case are:

$$E\left[\Delta Y_{i,t-j} * (\alpha_i + u_{i,t})\right] = 0 \tag{19}$$

$$E\left[\Delta X_{i,t-j} * (\alpha_i + u_{i,t})\right] = 0$$

At this point, it is important to test the validity of the instruments employed for GMM estimations. Two diagnostic tests have become a standard application to see whether the selected instruments are valid. One is the test for second or higher order autocorrelation and second is the Sargan test for correlation between instruments and error term. In the presence of second-order serial correlation in the errors for example, the twice-lagged values cannot be used as instruments. Also the Sargan test evaluates the orthogonality between the instruments and residuals, which involves testing the null of optimal instruments against the alternative of non-optimal instruments. In what follows, we estimate equations (12 – 15) employing all dynamic panel estimation methods to make sure that the results are not sensitive to the choice of estimation method.

3. Data Sources and Descriptive Statistics

The main sources of the data are from the World Bank Development Indicators of the World Bank (WDI, 2006) and the European Bank for Reconstruction and Development Transition Report (EBRD, 2007). The data set is an unbalanced panel covering 24 transition economies over the periods of 1990 – 2005. The countries included in the sample are Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovak Republic, Slovenia (Central Eastern Europe and the Baltic States), Bulgaria, Croatia, Romania, Albania, FYR Macedonia (South--eastern Europe), Russia, Armenia, Azerbaijan, Belarus, Georgia, Moldova, Ukraine, Kazakhstan, Kyrgyz Republic, Tajikistan, and Uzbekistan (Commonwealth of Independent States).

The data on foreign aid, GDP per capita, government consumption expenditures, imports and exports are obtained from the WDI while those on public revenue, borrowing, debt service and government investment are taken from the

EBRD. All variables except for GDP per capita are taken as a percentage of GNPs. The basic statistics of the variables are reported in Table 1.

T a b l e 1

Data Sources and Descriptive Statistics

Variable	Observations	Mean	Std Error	Minimum	Maximum
Aid	343	3.172	43.221	–0.54	56.7
Government Consumption	380	17.33	36.251	25.324	39.112
Government Investment	334	20.85	19.238	0.55	54.0
Revenue	333	34.10	29.860	39.240	73.1
Real GDP per capita	384	6 496.5	4 276.1	708.0	1 9815.0
Debt	332	43.160	11.018	0.0001	39.158
Export	379	44.11	17.15	44.743	90.7
Import	379	51.11	17.46	20.059	109.1
Borrowing	334	48.52	28.0	0.59	160.5

Note: All variables are measured in % of GNP except for GDP per capita.

4. Empirical Results

In panel data applications, how one treats country-specific effects is an important issue because cross-sectional specific effects are a potential source of bias and inconsistency in estimates. Especially, the existence of the lagged dependent variable as a regressor raises concerns over the consistency and unbia-sedness of the estimated coefficients. Therefore, four empirical specifications – fixed effect, level GMM, difference GMM and system GMM – are estimated to see whether the results are robust to different estimation methods. Using a panel of 24 transition nations over 1990 – 2005, equations (12 – 15) are separately estimated by all four dynamic panel estimation methods, and the results are presented in Tables 2 to 5. In the estimation of each equation employing GMM methods, maximum four lags of the lagged dependent variables are used as instruments.[4] The diagnostic tests (autocorrelation and Sargan tests) are performed in order to check the validity of the instruments in GMM estimators. The related p-values of these tests are presented at the bottom panel of these tables. According to the LM and Sargan tests, we fail to reject the nulls of both no second order serial correlation and of optimal instruments in all tables and estimation methods. Thus, these results provide support for the validity of the instruments used.

Table 2 reports the results from estimating equation (12), showing the effect of aid on public investment.

[4] Various lagged values are employed as instruments to see if the results are sensitive to the selected instruments. The choice of the instruments at different lags does not substantially alter the main findings.

Table 2

The Impact of Aid on Government Investment: 1990 – 2005

	Estimation Method			
	Fixed Effect	Level GMM	Difference GMM	System GMM
GDP per capita	0.0003 (0.0004)	0.0005 (0.0002)**	0.005 (0.002)**	0.0003 (0.0002)
Debt Rate	0.2486 (0.165)	0.063 (0.131)	–0.788 (0.399)**	0.047 (0.115)
Aid Rate	–0.028 (0.106)	0.347 (0.164)**	0.275 (0.162)*	0.263 (0.131)**
Export Rate	–0.112 (0.059)*	–0.080 (0.082)	0.037 (0.114)	0.040 (0.056)
Import Rate	0.035 (0.054)	–0.120 (0.078)	–0.184 (0.116)	–0.051 (0.052)
Lagged Government Investment	0.399 (0.089)***	0.509 (0.219)**	0.478 (0.154)***	0.593 (0.147)***
Lagged Government Consumption	–0.021 (0.131)	–0.039 (0.297)	–0.126 (0.601)	0.106 (0.166)
Lagged Revenue	0.107 (0.103)	0.401 (0.305)	–1.065 (0.703)	0.072 (0.166)
Lagged Borrowing	0.003 (0.016)	–0.108 (0.047)**	–0.111 (0.108)	–0.075 (0.031)**
Usable Total Obs.	282	194	202	218
Adj-R^2	0.81	–	–	–
Time Effects	yes	no	yes	no
Hausman Test	54.45***	–	–	–
p-values Sargan test	–	0.32	0.24	0.45
p-values for SC1 test	–	0.04	0.06	0.04
p-values for SC2 test	–	0.21	0.25	0.54

Note: Asterisks *, **, and *** show 10%, 5% and 1% levels of significance respectively.
SC1 and SC2 are the LM tests respectively for the first and second order serial correlation. The lagged values of the regressors are their first lags. These are the same in all tables.

Because our focus is primarily on the effect of aid, we will interpret only the estimated coefficient of aid. First it is worth noting that the magnitude of the estimated coefficient on the lagged dependent variable from the fixed effect method (first column) is smaller than those from GMM methods, a result that accords with the theoretical prediction. While it appears in fixed effect model that foreign aid has no significant impact on public investment, all GMM estimates show that it has a significant and positive impact, a result that is consistent with most of the previous work such as Khan and Hoshino (1992), Rodriguez et al. (1998) and Quattara (2006a). On the average, a 1 point increase in the aid ratio is associated with an approximately 0.27 point rise in the ratio of public investment to GDP. Aid seems to contribute somewhat to overall macroeconomic performance in transition economies through increasing expenditures on public infrastructure.

Table 3 reports the results from estimating equation (13), indicating the effect of aid on public consumption. The coefficient of aid is statistically insignificant across all estimation methods This finding does not support the conventional criticism that the governments in developing countries allocate a major bulk of foreign aid to consumption expenditures (Otim, 1996, p. 28). Table 4 presents the results on the effect of aid on government revenue. Aid seems to have no impact on revenue creation activities in these economies, which is robust to all estimation techniques. Once again, contrary to a widely held view that aid might provide incentives for governments to reduce their tax collection efforts, the

findings clearly show that aid does not inhibit revenue creation activities in these economies. This finding also corroborates with the earlier studies by Otim (1996), Rodriguez (2000), and Quattara (2006a).

T a b l e 3

The Impact of Aid on Government Consumption: 1990 – 2005

	Estimation Method			
	Fixed Effect	Level GMM	Difference GMM	System GMM
GDP per capita	0.0002 (0.0002)	–0.0002 (0.00014)	0.0002 (0.001)	–0.0000 (0.0001)
Debt Rate	–0.121 (0.067)*	–0.053 (0.067)	0.155 (0.221)	–0.081 (0.049)
Aid Rate	–0.017 (0.044)	0.007 (0.077)	0.031 (0.189)	–0.005 (0.060)
Export Rate	–0.006 (0.024)	–0.074 (0.028)**	–0.049 (0.066)	–0.072 (0.021)***
Import Rate	0.029 (0.022)	0.076 (0.027)***	0.102 (0.183)	0.081 (0.021)***
Lagged Government Investment	–0.118 (0.036)***	–0.235 (0.125)*	–0.159 (0.457)	–0.073 (0.053)
Lagged Government Consumption	0.476 (0.054)***	0.495 (0.121)***	0.764 (0.446)***	0.560 (0.064)***
Lagged Revenue	0.092 (0.042)**	0.191 (0.136)	–0.121 (0.643)	0.030 (0.051)
Lagged Borrowing	–0.013 (0.007)*	0.038 (0.019)*	0.008 (0.113)	0.011 (0.012)
Usable Total Obs.	282	194	194	218
Adj-R^2	0.88	–	–	–
Time Effects	yes	no	yes	no
Hausman Test	61.87***	–	–	–
p-values Sargan test	–	0.87	0.75	0.68
p-values for SC1 test	–	0.11	0.07	0.06
p-values for SC2 test	–	0.17	0.22	0.34

T a b l e 4

The Impact of Aid on Revenue: 1990 – 2005

	Estimation Method			
	Fixed Effect	Level GMM	Difference GMM	System GMM
GDP per capita	–0.0004 (0.0003)	0.0002 (0.0002)	0.0026 (0.0014)*	0.0002 (0.0002)
Debt Rate	0.117 (0.153)	0.029 (0.104)	–0.475 (0.218)**	0.022 (0.098)
Aid Rate	–0.186 (0.099)*	0.022 (0.162)	–0.009 (0.127)	–0.020 (0.134)
Export Rate	–0.090 (0.055)	–0.031 (0.050)	–0.039 (0.084)	–0.056 (0.042)
Import Rate	0.036 (0.05)	0.068 (0.052)	0.029 (0.088)	0.078 (0.041)*
Lagged Government Investment	–0.039 (0.083)	–0.227 (0.197)	0.456 (0.354)	–0.131 (0.124)
Lagged Government Consumption	0.115 (0.122)	–0.213 (0.219)	0.074 (0.505)	–0.165 (0.143)
Lagged Revenue	0.522 (0.096)***	0.885 (0.243)***	0.925 (0.511)***	0.701 (0.143)***
Lagged Borrowing	–0.004 (0.015)	–0.028 (0.029)	–0.060 (0.065)	–0.032 (0.022)
Usable Total Obs.	282	194	202	218
Adj-R^2	0.87	–	–	–
Time Effects	yes	no	yes	no
Hausman Test	40.58***	–	–	–
p-values Sargan test	–	0.19	0.37	0.52
p-values for SC1 test	–	0.02	0.01	0.07
p-values for SC2 test	–	0.55	0.74	0.63

Table 5 reports the results from public borrowing equation. The results consistently indicate that foreign aid has a positive and significant impact on public

borrowing in transition nations. While this finding confirms the results documented by Feeny and McQuillary (2003) and Pack and Pack (1993), it does not support the results presented by Quattara (2006a) for developing countries.

Overall, the fiscal responses to aid of the governments in transition economies appear to be fairly similar to those documented in the literature for developing economies. In particular, public investment is associated positively with foreign aid while there is no significant impact of aid on government consumption and revenue. However, the findings on the effect of aid on borrowing seem mixed while our analyses clearly show that aid increases public borrowing.

T a b l e 5

The Impact of Aid on Public Borrowing: 1990 – 2005

	Estimation Method			
	Fixed Effect	Level GMM	Difference GMM	System GMM
GDP per capita	0.003 (0.0009)***	0.0028 (0.0006)***	0.0038 (0.0034)	0.001 (0.0008)*
Debt Rate	0.417 (0.384)	1.098 (0.253)***	–1.438 (1.136)	1.025 (0.312)***
Aid Rate	1.225 (0.248)***	2.311 (0.534)***	2.136 (0.940)**	2.532 (0.501)***
Export Rate	0.455 (0.138)***	0.271 (0.164)*	0.515 (0.233)**	0.089 (0.164)
Import Rate	–0.133 (0.126)	–0.264 (0.147)*	0.085 (0.236)	–0.063 (0.135)
Lagged Government Investment	0.304 (0.207)	0.598 (0.186)***	5.452 (3.806)	–0.267 (0.324)
Lagged Government Consumption	0.032 (0.306)	0.106 (0.294)	4.274 (2.344)*	–0.687 (0.453)
Lagged Revenue	–0.029 (0.241)	–0.389 (0.206)*	–5.854 (3.790)	0.229 (0.364)
Lagged Borrowing	0.575 (0.038)***	0.622 (0.072)***	0.728 (0.411)*	0.596 (0.071)***
Usable Total Obs.	282	194	204	218
Adj-R^2	0.87	–	–	–
Time Effects	yes	no	yes	no
Hausman Test	84.65***	–	–	–
p-values Sargan test	–	0.15	0.54	0.27
p-values for SC1 test	–	0.01	0.03	0.03
p-values for SC2 test	–	0.14	0.18	0.28

Conclusion

The existing literature on aid effectiveness offers inconsistent conclusions on the impact of foreign aid on economic growth in developing economies, with some studies suggesting that it stimulates growth conditional on the goodness of policies implemented whereas other studies suggest that there is no clear-cut link between aid and growth even after accounting for policy environment. At this point, it seems more important to focus on the question of whether aid is one of the factors affecting the policy responses of governments since one may reasonably argue that it is perhaps the foreign aid in the first place that helps governments provide such a policy environment. To this end, there are few studies focusing on the effect of aid on government fiscal behaviour in developing countries. Given

the significance of foreign financial assistance for developing countries in general and for transition countries in particular, this paper examines that question using a sample of 24 transition economies in the context of a fiscal response model.

The empirical results suggest that foreign aid has a positive impact on public investment in transition economies, a result that is in line with the previous work on developing countries. The implication of this finding for economic growth is clear. A rise in public investment may not only directly affect growth but also indirectly through giving rise to private investment given a potential complementarity of public investment in infrastructure to private investment (Erden and Holcombe, 2005). In addition, contrary to the criticism that the governments in developing countries tend to allocate most of the foreign aid to financing consumption expenditures, the results indicate no evidence of the presence of such an effect. It is also worth noting that foreign aid provides no incentive for governments in transition economies to get distracted from their revenue creation activities. Finally the findings show that there is a strong positive impact of aid on public borrowing. Because foreign aid constitutes a much cheaper way of financing than any form of borrowing, one "reasonable" response of governments to aid is to use it as a substitute for borrowing. The governments in transition economies, however, appear to behave differently in the sense that aid leads them to over borrowing. If debt grows large, this can be harmful to the growth process in these economies through a substantial negative impact of indebtedness on physical capital accumulation and on total factor productivity growth (see for example Pattillo, Poirson, and Ricci, 2004).

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