

AID DISAGGREGATION AND THE PUBLIC SECTOR IN AID-RECIPIENT ECONOMIES: EVIDENCE FROM PAKISTAN

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Abstract. As foreign aid is mainly directed to the public sector of Pakistan, one can only recognize the broader macroeconomic impact of aid if one first understands its impact on fiscal behaviour of the government. To this end, the present study has estimated a fiscal response model using the annual time series data for the period 1972 to 2016. Foreign aid is disaggregated into two components, namely, foreign loans and foreign grants. Whereas public expenditures are classified as current expenditure, socio-economic expenditure and development expenditure while on revenue side tax revenue and domestic borrowing are used. The estimation task has been accomplished by using the generalized method of moments (GMM) technique. Results reveal that foreign aid (loans and grants) is a significant contributor in inducing the fiscal activities of the government of Pakistan. Aid has been found to increase development and non-development expenditures but at the same time it adversely impacts tax effort and domestic borrowing. The study suggests that government of Pakistan should devise ways for development-oriented use of foreign aid to enhance the productive capacity of the economy. A suitable mechanism ought to be chalked out by donors for monitoring tax revenue generating behaviour of the government of Pakistan in response to their financial assistance. More and unceasing aid is ensured only if the government of Pakistan maintains a certain threshold level of tax to GDP ratio.

Keywords: Foreign aid, fiscal response, GMM, Pakistan

JEL Classification: C30, F35, H30

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I. INTRODUCTION

Foreign aid in its modern form is a post-World War II phenomenon. From an economic perspective the rationale for foreign aid to poor developing economies is nested in two gap model as shown by Adelman and Chenery (1966), Chenery and Strout (1966), and three gap model as documented by Bacha (1990) and Taylor (1994). However, the extent to which the benefits of various aid programs translated into economic development of the aid recipient less developed countries has largely remained a questionable phenomenon, and a wide range of economic literature exists on the dilemma of aid under the banner of structuralism and dependency theories. A fundamental flaw in the aid-growth literature is that it ignores a basic reality that aid is chiefly earmarked by donors to the public sector of recipients. This fault will surely be serious if aid impacts public sector fiscal outcomes and if they, in turn, affect broader economic and social outcomes. As at the first stage foreign aid goes to the central treasury, therefore, it is logical to expect its significant influence on fiscal actions of aid recipient governments. There is, in short, a rational case for placing that the effect of aid on macroeconomic indicators including economic growth will be mediated by the recipient government's use of it (McGillivray, 2009, pp.527). Heller's (1975) seminal piece of work provided a comprehensive framework to study foreign aid and fiscal behaviour of the developing countries. The emergence of Heller's work paved the way for subsequent researches on fiscal response to foreign aid with far reaching consequences for both the donors and recipients of aid.

Due to widespread concern about the fungibility¹ of foreign economic assistance in the donor community, a quantitative study of the aid-recipient country's fiscal response is an important exercise in and of itself. An empirical investigation of aid- fiscal behaviour nexus certainly enables the researchers to look at the aid- growth association from a different perspective. From the analysis of fiscal response models donors can attain significant knowledge with regard to the impact of their economic assistance on the fiscal actions of a recipient government, notably how do revenue and expenditure sides of government budget get

¹ Fungibility occurs when aid earmarked for one use is diverted to alternative uses.

affected from foreign aid inflows. Foreign aid is a critical component of fiscal management in general, since a significant chunk of aid spent in a country goes to or by a public authority, or accounts the arrangement of public goods that would otherwise create pressure on the national exchequer (Morrissey, 2015a). Aid is expected to trigger observable changes not only in government expenditure but also in tax collection, either by influence on tax effort or through causing variations in tax rates or the tax base as a result of introducing fiscal reforms as per aid conditionality (Morrissey, 2015b). Likewise, donor conditionality can require aid to be linked to a reduction in the amount of public borrowing from domestic sources.

Moreover, one of the big blemishes attached with the existing aid effectiveness literature is that it overlooks difference in the nature of aid funds. Aid is heterogeneous, and hence it can rightly be anticipated that each of its components has diverse macroeconomic ramifications for the economy of an aid-recipient. Therefore, the common tradition of using a single figure for aid in the relevant body of literature is plagued with the limitation that it bitterly fails to consider the element of aid heterogeneity. Consequently, no one can exclude the existence of aggregation bias in the outcomes documented by the aid effectiveness literature (Mavrotas and Ouattara, 2003).

Pakistan has received massive foreign funds in the form of grants, commodity aid and loans on hard and soft term². Beginning out as an agrarian economy with few cotton and jute processing units in 1947, Pakistan developed rapidly as an industrial economy in the early 1960s. This development was based entirely on foreign aid and complete reliance on the advice of the experts from the donors³. In the mid-1960s it was declared by these experts that Pakistan was on the verge of take-off when all aid was suddenly stopped due to the war between India and Pakistan in 1965. As a result, by the end of 1960s Pakistan had reverted

²Brief discussion regarding Pakistan's economy is based on Zaidi, S.A. (2015). *Issues in Pakistan's economy: A political economy perspective*. Karachi: Oxford University Press. See chapters 6, 7, 13, 17, 18 and 25.

³The major donor was the US for strategic reasons, mainly to block Russia from reaching the warm waters of the Middle-East.

to its agrarian structure while due to the easy and free flow of foreign funds Pakistan did not recognize the need to focus on domestic resource mobilization. In fact, Pakistan wasted the foreign funds as it pampered its industrial class with massive incentives including extended tax holidays, maintaining overvalued exchange rates, duty free imports of industrial raw materials and machinery, and above all the payments of export bonuses to the industrialists in the form of foreign exchange which could be parked abroad. Consequently, the high earners adopted lavish lifestyles but never learnt to pay taxes to this day. In the early 1970s foreign inflows were mainly project- tied loans on soft and hard terms from the World Bank and Stand-By Arrangement with the International Monetary Fund (IMF). The inflow of foreign remittances from the Pakistani labor in the Middle- East in the second half of the 1970s blunted whatever little efforts were made to raise domestic resources. Furthermore, the Afghan war due to Russian intervention in the late 1970s once again led to an increased inflow of aid from the United States (US) and domestic resource mobilization was put on the back burner. Withdrawal of Russia from Afghanistan again led to the cessation of aid flows to Pakistan as was the case in late 1960s. The heavy and continued reliance on easy money from abroad and the neglect of the need for domestic resource mobilization led Pakistan into the IMF Structural Adjustment Programs web beginning in 1987, when budget deficit peaked at 8.8% of GDP. Pakistan, due to all the borrowings over its existence has ended up in debt trap due to heavy conditionality burden and higher interest rates. To continue borrowing rather than improving domestic resource mobilization successive governments have chosen to fulfill the most serious conditionality of reducing budget deficits to less than 5% by imposing massive taxes on essential basic domestic inputs of the industrial and agricultural sectors like water, gas and electricity. At the same time the overvalued exchange rate raised the cost of much needed imported machinery and technology for the major commodity producing sectors. The rapid increases in the cost of doing business in the 1990s ruined the economy as businesses moved out, and continue to do so, to other countries leading to massive unemployment and poverty while the official statistics manipulate the GDP and inflation figures. Keeping in view the poor fiscal response of foreign inflows by the various governments the objective of the present study is to analyze the influence of aid on the fiscal actions of the government of Pakistan by

estimating impact of aid flows on public sector development spending, current and socio-economic expenditures, tax revenue and domestic borrowing. The importance of this study stems from the fact that it accounts for and overcomes all the methodological deficiencies of the existing literature on Pakistan to provide reliable evidence and recommendations to the policymakers.

The rest of the study is organized as follows: section II critically reviews the existing literature on fiscal response to foreign aid in Pakistan; section III describes the analytical framework of the fiscal response model adopted for this study; section IV describes the variables used in the study, their transformations and sources of data; results are discussed in section V; and final section presents the conclusion and policy recommendations emerging from this study.

II. FISCAL RESPONSE TO FOREIGN AID IN PAKISTAN: EMPIRICAL LITERATURE

The role of foreign economic assistance in the economic development of developing nations is well documented in the literature but we are unable to get a consensus with regard to the role of foreign aid in attaining development goals of aid recipient countries. As foreign aid mainly works through the public sector of recipient governments, consequently, in aid effectiveness literature a debate has emerged pertaining to fiscal response to foreign aid in developing countries. In this regard Heller's (1975) study led to the development of vast literature on the subject of fiscal response to aid, particularly in developing countries. For the last three decades the number of researches applying fiscal response models have been increasing (see, for instance, Khan & Hoshino, 1992; McGillivray & Ahmed, 1999; Swaroop, Jha, & Rajkumar, 2000; Mavrotas, 2002, 2005; Gupta, Clements, Pivovarsky, & Tiongson, 2003; McGillivray & Ouattara, 2003; Mavrotas & Ouattara, 2003; Ouattara, 2006a, 2006b; Feeny, 2007; Erden & Guven, 2009; McGillivray, 2009; Feeny & McGillivray, 2010; Clistz & Morrissey, 2011; Bakhtiari, Izadkhasti, & Tayebi, 2013; Dayanath & Ichihashi, 2013; Thamae & Kolobe (2016); Bwire, Lloyd, & Morrissey, 2017, among others).

A considerable body of research exists on foreign aid and economic growth nexus in the context of Pakistan⁴ (see, for example, Brecher & Abbas, 1972; Khan & Rahim, 1993; Khan, 1997; Ishfaq & Ahmad, 2005; Mohey-ud-Din, 2006; Khan & Ahmed, 2007; Ali & Nishat, 2009; Javid & Qayyum, 2011; Ahmed & Wahab, 2011, among others). At the same time a limited number of studies also provide some useful insights into the fiscal repercussions of foreign aid in Pakistan. However, a careful review of these studies shows that they suffer from serious methodological and theoretical problems and hence nullify their outcomes as discussed in this section.

The first significant study by Khilji and Zampelli (1991) covering the period 1960 to 1986 analyzes Pakistan's expenditure allocations for defense, public non-defense, private investment, and private consumption with reference to the US military and non-military assistance to Pakistan. Their results indicate that both the US military and non-military aid is quite fungible. This study is beset with two serious caveats. Firstly, the assumption that both public and private goods are produced under the constant returns to scale technology does not hold in Pakistan. Secondly, the study restricts itself to the US aid to Pakistan only, whereas, Pakistan is a multilateral aid recipient. Hence, the outcomes of the study fail to assist in calking out broader fiscal policy in the presence of aid inflows to the country.

Chishti and Hasan (1992) employ the time series data over the period 1971 to 1988 to ascertain fiscal response to foreign aid (loan and grants included). Their results indicate that external loans do not have any impact on the public sector investment, while foreign grants have a positive impact on public sector investment. They explain that in the presence of external aid the government finances the public sector investment by about 10-15 % of the tax revenue and almost 72 to 73 percent of the domestic borrowings. However, three important limitations of the study affect the reliability of the results. Firstly, the authors have employed a quadratic utility function which also contains the linear terms. Binh and McGillivray (1993) criticize such a utility function on

⁴The existing studies have reported mixed evidence with regard to aid effectiveness in Pakistan.

the ground that the unconstrained maximum value of utility function cannot be attained. Secondly, all the estimated parameters are statistically insignificant except for one, this indicates that the model used in this study suffers from some econometric problems. Lastly the sample size (18 observations) is rather small for the meaningful time series analysis.

Iqbal (1997) analyzes the effect of inflow of foreign aid on fiscal behavior in Pakistan over the period 1976 to 1995. The study evaluates government's fiscal response with reference to social, development, non-development expenditures, and tax revenue. The results of the study show that foreign aid has a positive impact on non-development and social expenditures while its impact on development expenditure is although positive yet it is relatively small. The study also reveals that availability of foreign aid leads to a shift of public domestic resources from development projects to non-development projects. Furthermore, foreign aid enhances tax collection efforts by the government. The findings of the study are not reliable for three reasons. Firstly, the study has a very small sample size which is not desirable in order to conduct a time series analysis. The second flaw of the study is that it does not disaggregate aid variable either in terms of grants and loans or program aid and project aid. Finally, the assumption of the study that domestic borrowing is allocated only for development purposes only is factually incorrect in case of Pakistan.

Franco-Rodriguez *et al.*, (1998) evaluate the impact of aid on the public sector performance while treating aid as an endogenous variable in Pakistan. Structural and reduced form equations are derived and estimated by using time series data over the period 1956 to 1995. The results of the study show that government is allocating only half of the aid for consumption spending; aid to some extent has a positive influence on the public investment; there is a negative relationship between tax effort and foreign aid; and there is a positive relationship between aid and domestic borrowing. However, this study is also not free from flaws. Firstly, it does not provide any justification for utilizing the pre-1972 data as Pakistan was segregated into two sovereign states, namely, Bangladesh and Pakistan in December 1971. Secondly, the assumption that foreign aid is an endogenous variable is factually incorrect as evident from the foreign economic assistance history of the country. Thirdly, they claim

that data for target fiscal variables do not exist in Pakistan is invalid since all fiscal data are available in the annual budget statements published by the government. Finally, the regression technique adopted by the study to acquire values of target variables has been questioned by White (1994).

McGillivray (2000) probes the fiscal effects of foreign aid in Pakistan by employing annual time series data for the period 1956 to 1995. The study reports that 85 percent of grants; 68 percent of the tax revenue; 50 percent of loans; and 31 percent of domestic borrowing are earmarked for public investment respectively. Therefore, the study concludes that external aid is primarily used for public investment and it does not have any effect on taxation. The study's findings are unconvinced as the pre and post 1972 data are not compatible as pointed out earlier. Furthermore, when 11 out of the 16 estimated parameters are insignificant it indicates some inherent deficiency of the econometric methodology adopted by the study.

Ahmed (2002) analyzes the fiscal response to foreign aid covering the period 1980 to 2000. The results of the study show that foreign aid (loans and grants) is a significant driver of the fiscal actions of the government of Pakistan. Foreign debt is mainly used for public sector development programs, and grants supplement the non-development expenditures of the government. Furthermore, foreign loans and grants have opposite impact on the of tax revenue collection efforts in Pakistan; the former increases tax revenue collection efforts while the latter induces a decline in tax revenue collection. However, this study is beset with serious methodological flaws. Firstly, the sample size of the study consists of twenty-one observations which is fairly inadequate to obtain reliable results from a time series analysis. Secondly, the study generates values of the target variable by means of a regression method is flawed as pointed out by White (1994). Furthermore, as pointed out earlier all data on the required target variables are available in Pakistan's annual budget statements. Finally, the study works with single equation models while a meaningful analysis on the topic requires a simultaneous equation framework as developed by Heller (1975).

Butt and Javed (2013) study the effects of foreign aid on the fiscal behavior of the government during the period 1960 to 2010. They estimate three interdependent equations by employing the Autoregressive

Distributed Lag (ARDL) model. The study shows that foreign aid tends to reduce the domestic tax revenue collection. However, on the expenditure side, both development and non-development expenditures are positively related to foreign aid. This study is also plagued with data and methodological issues. Firstly, the scope of the study is restricted since it considers only the grant component of foreign aid. Over time the grant component is almost negligible and debt burden of loans has increased enormously. Hence, fiscal response to aid cannot be accurately estimated by excluding the debt component of aid from the analysis. Secondly, the study does not justify the model employed as it does not qualify to be in the class of standard Heller's fiscal response model or any of its modified versions. It is not clear why the study is trying to estimate a set of interdependent equation by means of the autoregressive distributive lag (ARDL) model which is a single equation technique.

This review of the studies pertaining to the fiscal response to foreign aid in Pakistan clearly shows that not only the research on this important issue is limited but the existing studies are also plagued with various methodological and data issues. The limitations of these studies make their outcomes dubious for policymakers, therefore, it is imperative to re-examine the fiscal response to foreign aid in Pakistan for sound policy recommendations.

III. ANALYTICAL FRAMEWORK

FISCAL RESPONSE MODEL

Heller (1975) provided the first fiscal response model which not only identified the nature of association between budget aggregates but also revealed the efforts of a government to achieve certain revenue and expenditure targets. The model is based on two major assumptions: a) that utility maximization is the main aim of the policymakers in the developing countries in the presence of certain budget constraints; b) it assumes that domestic borrowing can only be utilized for financing public sector investment or development expenditures. A number of studies including Gang and Khan (1991); Khan and Hoshino (1992); Otim (1996) and Gupta et.al., (2003) have adopted Heller's model directly. However, this model is beset with some serious methodological

problems. Firstly, in the presence of linear terms the unconstrained utility function cannot be maximized in a situation when target values of the choice variables are derived as pointed out by Binh and McGillivray (1993); Secondly, computing the target values of the choice variables through a regression model will surely create an issue of consistency between targets so generated with the budget constraints as explained by White (1994). Finally, Heller's assumption that domestic borrowing can only be used for financing public sector development projects is highly inconsistent with the prevailing situation in almost all the developing countries including Pakistan. In view of the above-mentioned shortcomings researchers have been engaged in developing some modified fiscal response models to better investigate the budget response to aid (see Binh&McGillivray1993; White, 1994; McGillivray, 2000; Mavrotas &Ouattara, 2003). Therefore, this study adopts a modified version of Heller's model to analyze the fiscal response of foreign aid to Pakistan as described below.

Policymakers in developing countries including Pakistan struggle to allocate revenues among different expenditure categories subject to serious budgetary constraints. It is assumed that they reflect their preferences through the following utility function:

$$U = f(D, T, S, C, B; L, G) \quad (1)$$

where,

D = public sector development expenditure

T = tax revenue

S = socio-economic expenditure

C = current expenditure

B = domestic borrowing

L = foreign loans from all sources

G = foreign grants from all sources.

Following the standard practice in the relevant literature the utility function (1) can be represented as a quadratic loss function:

$$U = \delta_0 - \frac{\delta_1}{2}(D - D^*)^2 - \frac{\delta_2}{2}(T - T^*)^2 - \frac{\delta_3}{2}(S - S^*)^2 - \frac{\delta_4}{2}(R - R^*)^2 - \frac{\delta_5}{2}(B - B^*)^2 \quad (2)$$

where, the asterisks represent exogenous target of endogenous variables and $\delta_i \geq 0$ for $i = 1, \dots, 5$. Utility function (2) implies that the government of Pakistan sets targets for revenue and expenditure categories annually. Any deviation from these targets leads to loss in utility. The public decision makers are faced with the following two budget constraints which are pivotal in utility maximization process:

$$D = (1 - \rho_{12})T + (1 - \rho_{22})L + (1 - \rho_{32})G + (1 - \rho_{42})B \quad (3)$$

$$S + C = \rho_{12}T + \rho_{22}L + \rho_{32}G + \rho_{42}B \quad (4)$$

where,

$1 - \rho_{12}$ reflects share of total tax revenue allocated to public sector investment;

$1 - \rho_{22}$ expresses part of foreign loans utilized in public sector investment;

$1 - \rho_{32}$ indicates portion of foreign grants allocated to public sector investment; and

$1 - \rho_{42}$ denotes proportion of domestic borrowing assigned to public sector investment.

For maximizing (2) subject to (3) and (4) results in the following Lagrange function:

$$\begin{aligned} L = & \beta_0 - \frac{\beta_1}{2}(D - D^*)^2 - \frac{\beta_2}{2}(T - T^*)^2 - \frac{\beta_3}{2}(S - S^*)^2 - \frac{\beta_4}{2}(R - R^*)^2 \\ & - \frac{\beta_5}{2}(B - B^*)^2 + \lambda_1 (D - \rho_{11}T - \rho_{21}L - \rho_{31}G - \rho_{41}B) \\ & + \lambda_2 (S + R - \rho_{12}T - \rho_{22}L - \rho_{32}G - \rho_{42}B) \end{aligned} \quad (5)$$

where, λ_1 and λ_2 are Lagrangean multipliers. Following Iqbal (1997), Franco-Rodriguez *et.al.*, (1998) and McGillivray (2000) it is assumed that the public decision makers sets no target for domestic borrowing in Pakistan i.e., $B^* = 0$. The solution of the first order conditions obtained from the Lagrange function (5) yield the following system of structural equations:

$$C = \phi_1(\rho_{12}T + \rho_{22}L + \rho_{32}G + \rho_{42}B) - \phi_1S^* + \phi_2C^* \quad (6)$$

$$S = (1 - \phi_1)(\rho_{12}T + \rho_{22}L + \rho_{32}G + \rho_{42}B) - \phi_2C^* + \phi_1S^* \quad (7)$$

$$D = \phi_8(\rho_{41})^2D^* + \phi_9\rho_{41}^2(\rho_{11}T + \rho_{21}L + \rho_{31}G) - \phi_{10}\rho_{41}\rho_{42}(S - S^*) \quad (8)$$

$$T = \phi_3T^* - \phi_5L - \phi_6G - \phi_4B + \phi_{16}\rho_{11}D^* + \phi_7\rho_{12}S^* + \phi_7\rho_{12}C \quad (9)$$

$$B = \phi_{11}\rho_{41}D^* + \phi_{12}\rho_{42}C + \phi_{12}\rho_{42}S^* - \phi_{13}T - \phi_{14}L - \phi_{15}G \quad (10)$$

The estimation of system of equations (6) to (10) will yield structural parameters of the model from which direct incremental effects of revenue variables including foreign aid effect on fiscal aggregates will be revealed. However, this estimation exercise fails to yield total impact of foreign aid, taxes and domestic borrowing on different budget aggregates. This situation makes it imperative to employ the reduced form set of equations so that total impact (direct and indirect) situation can be gauged. The reduced form solution of the structural equations (6) to (10) gives rise to the following system of equations:

$$C = \Psi_1T^* + \Psi_2S^* + \Psi_3L + \Psi_4G + \Psi_5D^* + \Psi_6C^* \quad (11)$$

$$B = \Psi_7T^* + \Psi_8S^* + \Psi_9L + \Psi_{10}G + \Psi_{11}D^* + \Psi_{12}C^* \quad (12)$$

$$T = \Psi_{13}T^* + \Psi_{14}S^* + \Psi_{15}L + \Psi_{16}G + \Psi_{17}D^* + \Psi_{18}C^* \quad (13)$$

$$S = \Psi_{19}S^* + \Psi_{20}C^* + \Psi_{21}T^* + \Psi_{22}L + \Psi_{23}G + \Psi_{24}D^* \quad (14)$$

$$D = \Psi_{25}D^* + \Psi_{26}T^* + \Psi_{27}S^* + \Psi_{28}L + \Psi_{29}G + \Psi_{30}C^* \quad (15)$$

DATA AND ECONOMETRIC METHODOLOGY

Consistent time series data for the period 1972 to 2016 are used for analyzing the fiscal behaviour of the government of Pakistan in the presence of aid inflows. All the required data are sourced from Annual Budget Statements, Government of Pakistan, Annual Reports of the State Bank of Pakistan and Pakistan Economic Survey (various issues), Government of Pakistan. All the data are taken at constant prices of 2010 and the variables are transformed as percent of GDP. Degree of

disaggregation is one of the distinctive attributes about the data of Pakistan's economy. The statistics in the budget document in Pakistan are disaggregated into four components; revenue receipts and expenditures and capital receipts and expenditures. Both the revenue and expenditures are further disaggregated as revenue expenditures on current account, revenue expenditures on development account, capital expenditures on current account and capital expenditures on development account. Revenue expenditures comprise of all those expenses which are not generating any assets, whereas, revenue receipts incorporate revenue from taxes as well as from other sources. Capital expenditures include creation of physical assets like buildings, roads, water systems, and electricity generation plants etc. A receipt that results in either reduction in government assets (sale of share, disinvestment) or increase in some liability (government borrowings) is a capital receipt. Capital receipts include domestic borrowing, foreign loans, small savings and Government Provident Funds etc.

The objective of this study is to estimate two systems of simultaneous equations, one for direct impact analysis (equations from 6 to 10) and the other for total impact analysis (equations from 11 to 15) for the purpose of drawing inference about budgetary response to aid in Pakistan. Due to simultaneity issue the endogeneity problem is likely to occur in our fiscal response model. Therefore, we prefer to employ the Generalized Method of Moments (GMM) technique developed by Hansen (1982) for estimation purpose.

IV. RESULTS AND DISCUSSION

We begin our estimation task by gauging system of simultaneous equations (6 to 10) for obtaining structural parameters of the model. Table 1 reports the results. Before analyzing the results of the structural parameters it is important to point out that this model is correctly specified as shown by the J test statistic and its associate probability given at the bottom of Table 1. Value of J test statistic is 0.262 and its associated probability value is 0.965 which indicates that instruments used in the study are valid and hence, the estimated fiscal response model is correctly specified.

TABLE 1
Estimates of Structural Equation Parameters

Parameter	Estimate	t-statistic
ρ_{12}	0.805***	25.001
ρ_{22}	0.274***	16.637
ρ_{32}	0.593***	3.080
ρ_{42}	0.833**	2.496
ϕ_1	0.596***	26.314
ϕ_2	0.393***	18.326
ϕ_3	0.736***	45.465
ϕ_4	0.024***	3.858
ϕ_5	0.315***	13.548
ϕ_6	0.899***	5.943
ϕ_7	0.265***	8.900
ϕ_8	1.479***	6.987
ϕ_9	0.177***	7.981
ϕ_{10}	0.043	0.539
ϕ_{11}	0.594**	2.275
ϕ_{12}	1.308***	12.060
ϕ_{13}	0.154*	1.872
ϕ_{14}	2.194***	7.346
ϕ_{15}	0.166*	1.755
ϕ_{16}	1.279**	2.161
J-stat	0.262	Probability 0.965

Note:***, ** and * indicate significant at 1%,5% and 10% levels respectively

The results show that the estimated coefficients of budget constraint equations ρ_{12} , ρ_{22} , ρ_{32} and ρ_{42} are within the theoretical range i.e. between 0 and 1. This outcome implies that only the available amount of each revenue is allocated in three main categories of public expenditure

in Pakistan. Moreover, all the structural parameters (ϕ s) carry a positive sign as expected⁵. All the parameters of the model are statistically significant except ϕ_{10} . The estimate of ρ_{12} (coefficient of T) is 0.805, implying that almost 81 percent of total tax revenue is utilized in meeting current and socio-economic expenditures. However, it is important to disaggregate these expenditures. The current budget allocations according to official statistics include: administration / salaries and wages;⁶ civil component of defense services; and interest payments on all domestic federal and provincial loans (as reported in Pakistan Economic Survey and Statistical Yearbook of Pakistan (various issues)). All these expenditures taken together on average have increased from 75% of total expenditures in 1990-91 to more than 85% in 2001-02, and stood at 82% of total expenditures in 2016-17. On the other hand, expenditures on socio, economic and community services include health, education, labor services, and law and order. Expenditures under this heading average 18% to 20% over the same periods, reflecting a serious neglect of the poor. It clearly indicates the unproductive use of taxes in Pakistan in the face of stagnant and at times declining tax to GDP ratio in Pakistan.⁷ Overall, this finding is consistent with the results of Heller (1975) for eleven African countries, Gang and Khan (1991) for India, Chishti and Hasan (1992), Otim (1996), Iqbal (1997) and Franco-Rodrigues et al., (1998) in case of Pakistan, and Feeny and McGillivray (2010) in case of Papua New Guinea. However, McGillivray (2000) reports that only one third of total tax revenue is allocated to the public consumption spending in Pakistan which is surprising and it points to some inherent problem in data and model estimation as the government statistics refute this evidence.

⁵To have consistency between a theoretical fiscal response model and its empirical results the coefficients of budget constraint equations ρ s must lie between zero and one while all the structural parameters must be positive (McGillivray & Outtara, 2005; Feeny & McGillivray, 2010). Unfortunately, most of the existing studies related to the fiscal response in Pakistan have overlooked this consistency condition.

⁶ It represents the size of the governments which have increase enormously due to political pressures in order to show that one party in power have generated more employment than the other ever since 1972.

⁷Average of tax to GDP ratio for the sample period of the study is 10.45.

The estimate of ρ_{22} (coefficient of L) is 0.274 which indicates that almost 27 percent of foreign loans are utilized in meeting consumption and socio-economic expenditures while almost 73 percent of foreign loans flow to public sector investment in Pakistan. This finding reflects the fact that since Pakistan, like many other developing countries, is faced with scarcity of financial resources it has to borrow on large scale to finance public sector investment. In other words, the loan component of foreign inflows is largely project tied to finance projects like water reservoirs, power generation, and sector specific provision of new technologies, as was the case of agricultural revolution in Pakistan in the mid-1960s when high yield wheat seed called Maxi-Pak was introduced. Similarly, the major industries of Pakistan, especially textiles and sea food industry have received exclusive financing to improve their export volumes and contents. The transfer of digital technology and expertise leading to the promotion of hardware and software exports has been possible through loans for public sector investments from developed countries. Similar results with respect to this variable have been reported by some previous studies related to various developing countries including Pakistan (see Heller,1975; Khan & Hoshino, 1992; Otim, 1996; McGillivray, 2000; Ouattara,2006a; Martins,2007; Senbet & Senbeta, 2009; Feeny & McGillivray, 2010). Nonetheless, Feeny (2007) reports a contradictory finding for Melanesia⁸ where aid loans are mainly used in financing current public spending.

The estimate of ρ_{32} (coefficient of G) is 0.593 which implies that almost 59 percent of foreign grants is used to finance the current and socio-economic expenditures, whereas, nearly 41 percent share of foreign grant goes to development expenditures or public sector investment. In this case it is important to point out that the disaggregation of expenditures between current and socio-economic categories will show that a larger chunk of the 59% allocation of aid has been allocated for socio, economic and community services. In fact, these sectors are largely dependent on foreign grants, particularly in remote regions. The dependence of these sectors on grants is also responsible for the poor

⁸Four sovereign states, namely, Fiji, Papua New Guinea, the Solomon Islands and Vanuatu are included in this region.

financing of the social sectors as grants have become almost negligible overtime. Furthermore, unless the grant is project specific the government has the discretion to utilize it as it pleases. The outcome of this variable corroborates earlier findings by Heller, 1975; Khan & Hoshino, 1992; Otim, 1996; McGillivray, 2000; Ouattara, 2006b; Martins, 2007; Senbet & Senbeta, 2009; Feeny & McGillivray, 2010).

With regard to ρ_{42} (parameter attached with B) we find that its value is 0.833. This implies that almost 83 percent of domestic borrowing is used to finance non-development expenditures in Pakistan and only 17 percent of domestic borrowing goes to public sector development spending. This result conforms to the outcome associated with variable T, the tax revenue has to be supplemented with domestic borrowings to finance the current or non-development expenditure resulting in massive domestic debt and higher interest payments. In fact, in rupee terms the domestic debt far exceeds the external debt, hence, interest payments on domestic debt have always exceeded the interest payments on foreign debt by more than 2% in rupee terms (see Pakistan Economic Survey, tables 4.5 and 4.6 (various issues). It is indeed ironic that domestic public debt is mounting by every passing day without causing any increase in the productive capacity of the economy. This finding is akin to that of Mavrotas and Ouattara (2003) and Mavrotas (2005).

TABLE 2
Incremental Impact Results

Impact	Mechanism	Estimate
L on C	$\phi_1\rho_{22}$	0.163
L on S	$(1-\phi_1)\rho_{22}$	0.111
L on D	$\phi_9(1-\rho_{42})^2(1-\rho_{22})$	0.022
L on T	$-\phi_5$	-0.315
L on B	$-\phi_{14}$	-2.194
G on C	$\phi_1\rho_{32}$	0.353
G on S	$(1-\phi_1)\rho_{32}$	0.240

Impact	Mechanism	Estimate
G on D	$\phi_9(1-\rho_{42})^2(1-\rho_{32})$	0.012
G on T	$-\phi_6$	-0.899
G on B	$-\phi_{15}$	-0.166
T on C	$\phi_1\rho_{12}$	0.480
T on S	$(1-\phi_1)\rho_{12}$	0.325
T on D	$\phi_9(1-\rho_{42})^2(1-\rho_{12})$	0.006
T on B	$-\phi_{13}$	-0.154
B on C	$\phi_1\rho_{42}$	0.496
B on S	$(1-\phi_1)\rho_{42}$	0.337
B on T	$-\phi_4$	-0.024

The results for the direct incremental impact analysis of aid and other revenue sources on fiscal aggregates are reported in Table 2. It is apparent from Table 2 that both aid loans and grants lead to greater increase in current and socio-economic expenditures as compared to development spending. With regard to the incremental effects of foreign loans and grant on tax revenue we see that both are negatively associated with tax revenue collection effort. It implies that 1 rupee addition in foreign loans and grants is associated with 0.315 and 0.899 rupee decline in taxation respectively. This outcome indicates that both the components of foreign aid have discouraged domestic resource mobilization efforts in Pakistan. The incremental effect of both the components of foreign aid on domestic borrowing is negative which implies that foreign aid substitutes domestic borrowing in Pakistan. However, the adverse effect of aid loans on domestic borrowing is far greater than that of aid grants as one additional rupee in the form of aid loans and grants brings 2.194 and 0.166 rupee decline in domestic borrowing respectively.

The direct effect of tax revenue on current and socio-economic expenditures is positive such that one rupee increase in tax revenue leads to 0.480 and 0.325 and 0.006 rupees increase in current, socio-economic, and development expenditures in the presence of foreign aid. This

implies that in the presence of foreign aid the direct impact of tax revenue on public investment is considerably small. However, the direct impact of tax on domestic borrowings is negative. Finally, the direct impact of domestic borrowing on various fiscal aggregates shows that domestic borrowing tends to increase current and socio-economic expenditures such that one rupee increase in domestic borrowing tends to increase current and socio-economic expenditures by 0.496 and 0.337 rupee respectively. However, domestic borrowing is negatively linked with tax revenue in Pakistan i.e., every additional 1 rupee of domestic borrowing results in 0.024 rupee reduction in tax revenue.

As pointed out in section III the estimation of structural system of equations provides the direct incremental effects of revenue variables including foreign aid on fiscal aggregates. In order to assess the total impact of foreign aid, taxes and domestic borrowings on different budget aggregates we estimate the reduced form parameters as given by equations 11–15 as shown in Table 3.

TABLE 3
Total Impact of Foreign Aid

Impact	Parameter	Estimate
L on C	Ψ_3	0.027
L on S	Ψ_{22}	0.163
L on D	Ψ_{28}	0.281
L on T	Ψ_{15}	-0.198
L on B	Ψ_9	-0.207
G on C	Ψ_4	0.144
G on S	Ψ_{23}	0.524
G on D	Ψ_{29}	0.099
G on T	Ψ_{16}	-0.176
G on B	Ψ_{10}	-0.152

Note: Reduced form parameters are obtained from system of structural equations. Keeping all the insignificant parameters equal to zero

It is obvious from Table 3 that the total effect of loans on current, socio-economic and development spending is positive but it is less than its direct impact on current spending, whereas, in case of socio-economic and development expenditures it surpasses its direct effect. Furthermore, total impact of loans on public sector development expenditure has a dominant impact on current and socio-economic expenditures in Pakistan. This finding shows relatively more pro-development use of loans in the country. The signs of estimated reduced form loan parameters are negative for the tax revenue and domestic borrowing implying adverse total effect of loans on tax revenues and domestic borrowing. However, the extent of negative effect is less than the direct impact for both the variables. Total impact of foreign grants is also similar to that of aid loans on three categories of public expenditure in Pakistan. This finding strengthens the direct impact case that grants are mainly used for non-development and socio-economic spending heads of the budget in Pakistan. Finally, total impact of grants on tax revenue and domestic borrowing is negative but its extent is less than that in case of direct impact.

V. CONCLUSION AND POLICY IMPLICATIONS

Following the influential study on fiscal response to foreign aid by Heller (1975), considerable literature focusing foreign aid and fiscal response association has emerged. However, due to various methodological issues we see that the existing body of literature has not provided reliable evidence with regard to the effectiveness of foreign aid and the budgetary response. In the context of Pakistan despite massive aid inflows over the decades economic and social sector performance has remained below the desired standards. The literature focusing on the extent to which foreign aid alters the fiscal actions of the government is not only scanty but also suffers from serious methodological flaws. Hence, there is a dire need of re-examining the issue analyze the impact of foreign economic assistance on public fiscal aggregates in Pakistan.

The present study reinvestigates the role of foreign aid in determining the budgetary response of the government of Pakistan using annual time series data over the period 1972 to 2016. Foreign aid is disaggregated into two major components, namely, foreign loans and foreign grants. Whereas, public expenditures are classified as current

expenditure, socio-economic expenditure and development expenditure the revenues comprise of tax revenue and domestic borrowings. The findings of the study reveal that all the three categories of fiscal expenditures are positively associated with both the components of aid. Aid loans are mainly used for public sector investment and grants are mainly earmarked for non-development spending respectively. Both the components of foreign aid adversely domestic resource mobilization, implying thereby that foreign aid is one of the major factors responsible for low tax base in Pakistan. Availability of foreign aid has made the governments complacent and blunted the needed efforts to increase the tax - GDP ratio. While the impact of tax revenue is positive for current, socio-economic and development expenditures, economic history shows that it is largely utilized to meet the current expenditures while the socio, economic and community services are largely dependent on grants in aid. Only a small amount of tax revenues is available for public sector development programs. The negative relationship of tax revenues with domestic borrowings implies that that the lower tax to GDP ratio in Pakistan is the main cause of rapid increase in domestic debt. In other words, the insufficiency of tax revenue paves the way for rise in domestic borrowing in Pakistan. Finally, domestic borrowing is also mainly earmarked for current and socio-economic expenditures and this indicates less productive use of the ever-increasing burden of domestic debt and interest payments.

On the basis of the findings of the study some important policy recommendations are put forward. Firstly, a significant portion of foreign aid is dispensed in non-development expenditures due to which Pakistan remained unable to make full productive use of foreign economic assistance. Therefore, need is to change the current policy of foreign aid utilization in Pakistan in such a manner that more allocation of foreign aid inflows should be for increasing the size and level of public sector investment in the country. Secondly, domestic borrowing is chiefly consumed by non-development needs of the government which is clearly a sign of misuse of domestic resources. Hence, there ought to be strict implementation fiscal discipline in Pakistan to restrict the government fiscal actions within well specified expenditures limit and forcing the government to make more and more productive use of domestic borrowing. Thirdly, the negative association between foreign aid inflows

and tax revenue effort suggest that government should revise its current fiscal management stance such that tax to GDP ratio can be increased so that the reliance of government on foreign economic assistance may come down. In this regard need is to take appropriate steps for proper documentation of the economy and increasing the tax base in the country. Finally, a suitable mechanism ought to be chalked out by donors for monitoring tax revenue generating behaviour of the government of Pakistan in response to their financial assistance. More and unceasing aid is ensured only if the government of Pakistan maintains a certain threshold level of tax to GDP ratio.

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