Fiscal Response to Foreign Aid in an Aid-Recipient Economy: Reassessment for Pakistan

Tahir Mukhtar[1] and Markus Brueckner[2]

ABSTRACT

Pakistan is placed among the family of aid dependent developing countries and this characteristic of Pakistan's economy makes it a pertinent case for scrutinizing budgetary response to aid. The present study looks at the impact of disaggregated aid flows on key fiscal variables in Pakistan using a fiscal response model applied to time series data over the period 1972 to 2016. The findings of the study paint quite a dismal picture prevailing in the country. Aid loans and grants are largely earmarked for development and non-development public spending respectively, and they tend to displace tax revenue in the country which is a grave adverse fiscal consequence of aid for the country.

ملخص

تُصنف باكستان ضمن عائلة البلدان النامية التي تعتمد على المساعدات، وهذه السمة المميزة للاقتصاد الباكستاني تجعلها حالة وثيقة الصلة بتمحيص الاستجابة المتعلقة بالميزانية للمساعدات. والدراسة الحالية تبحث في تأثير تدفقات المعونة المصنفة على المتغيرات المالية الرئيسية في باكستان باستخدام نموذج الاستجابة المالية المطبق على بيانات السلاسل الزمنية خلال الفترة الممتدة ما بين 1972 إلى 2016.وترسم نتائج الدراسة صورة كئيبة سائدة في البلاد. فالقروض ومنح المعونة تُحصص إلى حد كبير للإنفاق العام التنموي وغير التنموي على التوالي، وهي تميل إلى إزاحة الإيرادات الضريبية في البلاد، وهو ما يعد نتيجة مالية خطيرة معاكسة للمساعدة من أجل البلاد.

ABSTRAITE

Le Pakistan fait partie de la famille des pays en développement dépendant de l'aide et cette caractéristique de l'économie pakistanaise en fait un cas pertinent

---

[1] Associate Professor, Department of Economics, Fatima Jinnah Women University, Rawalpindi, Pakistan.Post Doctorate Fellow, Research School of Economics, Australian National University, Canberra, Australia.
[2] Professor, Research School of Economics, Australian National University Canberra, Australia.

pour l'examen de la réponse budgétaire à l'aide. La présente étude examine l'impact des flux d'aide désagrégés sur les principales variables budgétaires au Pakistan en utilisant un modèle de réponse budgétaire appliqué aux données de séries chronologiques sur la période 1972 à 2016. Les conclusions de l'étude dressent un tableau assez sombre de la situation dans le pays. Les prêts et les subventions de l'aide sont en grande partie destinés aux dépenses publiques de développement et de non-développement respectivement, et ils ont tendance à déplacer les recettes fiscales du pays, ce qui constitue une conséquence fiscale négative grave de l'aide pour le pays.

1. Introduction

Foreign economic assistance has been a vital wellspring of development financing for the capital deficit underdeveloped economies since the conclusion of the World War II. Both the United States (US) and the United Soviet Socialist Republics (USSR), keeping in mind the end goal to keep up their political dominion, offered enormous monetary and technical aid to various poor nations. Apart from this political reasoning, the economic motivation for aid to developing countries has been well justified by the two gap and three gap models (see, for instance, Chenery and Bruno, 1962; Chenery and Strout, 1966; Bacha, 1990). However, the extent to which foreign aid programs have promoted economic development in these countries, at best remains controversial as reflected in the vast body of economic literature that exists under the banner of structuralism and dependency theories. One important factor impeding the full impact of foreign aid in developing countries is the phenomenon of fungibility[3] of aid flows, which is also recognized by donors and supporters of foreign aid. In the face of serious domestic resource constraints these countries tend to shift the flow of foreign aid from productive to non- productive uses. This phenomenon has serious consequences in a situation of sudden stoppage of foreign aid. Hence, it raises the query as to how an aid recipient government will prioritize the allocation of resources among different spending heads. This inquiry was dealt with by Heller (1975) through his seminal piece of work which gave a well specified analytical tool to bring under investigation budgetary

---

[3]Fungibility occurs when aid earmarked for one use is diverted to alternative uses.

response to aid in the context of aid recipient economies. Heller's work opened the channels for further research in this area.

Due to widespread concern about the fungibility 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 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).

From the economic history of Pakistan, it is evident that since its emergence as a sovereign state in the world in 1947, Pakistan has greatly been depending upon foreign economic assistance, even though it does not fall in the community of the poorest economies. The basic stated motive of the country behind lusting for aid is to supplement its domestic

resources, needed for economic growth and development. Due to increasing foreign debt burden, unnecessary tough conditionalities attached with aid flows besides economic and strategic interests of donors, especially, of the US, the Pakistan's economic assistance history does not portray a pleasant picture. This inauspicious reality has incited a hot debate concerning the repercussions of foreign aid for the macroeconomic performance of the country. It is an undeniable fact that foreign economic assistance to Pakistan has remained quite significant during the last seven decades, but the growth experience of the country is not remarkable which provokes the issue of aid effectiveness in Pakistan. As almost all the amount of foreign aid initially becomes a part of the national exchequer, understanding fiscal response to aid is a pre-requisite to identify broader effects of aid on the economy. Unfortunately, in case of Pakistan the aid-growth literature fails to explicitly recognize the fact that aid is given primarily to the government and hence any impact of aid on macroeconomic performance of the economy will be mediated by the government fiscal behaviour.

The present study aims at determining the fiscal response to aid in Pakistan by gauging its impact on spending and revenue sides of the budget. This analysis is chosen because of the ongoing hot debate between the aid-donor agencies and the policy-makers in Pakistan. It has policy implications not only for the government's foreign borrowing strategy but also for its fiscal policy. Like most developing countries, the role of the public sector in economic activities has been considerable in Pakistan. Moreover, increases in taxes have become growingly difficult for the public decision makers because of economic cost and political resistance of the masses. The significance of the present study is apparent from its distinctive nature vis-a-vis existing studies related to fiscal response and aid association in case of Pakistan as briefly discussed in subsequent section on literature review. This study will hopefully provide useful guidelines to the policy-makers and the donors at the same time.

Following this introduction, the rest of the study is structured as follows: section 2 consists of survey of literature mainly pertaining to Pakistan; section 3 describes in detail the fiscal response model to be used in the study; section 4 elaborates the data and estimation technique; section 5 presents detailed discussion on the results; and finally, section 6 gives the conclusion and policy recommendations.

2. Literature Review

 Although there is a large body of literature on aid-growth association in case of developing world yet it is also true that there is no consensus on the contribution of aid flows in achieving economic development objectives in aid recipient economies. Since foreign aid is primarily delivered through the national exchequer of aid recipient governments, a debate about the implications of aid for fiscal policy formulation and implementation in developing economies has arisen in the literature on aid effectiveness. To this end, Heller (1975) developed an econometric model of the public sector of eleven African countries to examine the role of aid in shaping fiscal responses. In view of Heller the decision-makers, in the less developed countries, maximise a well-defined utility function consisting of public policy objectives subject to financing constraints. Heller's (1975) work 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 has been increasing (see, for instance, Khan and Hoshino, 1992: McGillivray and Ahmed,1999;Swaroop, Jha, and Rajkumar, 2000; Mavrotas, 2002,2005;Gupta et al.,2003; McGillivray and Ouattara, 2003; Mavrotas and Ouattara, 2003;Ouattara,2006a, 2006b;Feeny, 2007; Erden and Guven, 2009; McGillivray, 2009; Feeny and McGillivray 2010; Clistz and Morrissey, 2011; Bakhtiari, Izadkhasti, and Tayebi, 2013;Dayanath and Ichihashi, 2013; Thamae and Kolobe,2016; Bwire, Lloyd, and Morrissey, 2017,among others).

Despite the importance and relevance of the issue empirical research with regard to foreign assistance and fiscal response has been very limited in Pakistan. Furthermore, the existing relevant literature needs to be reviewed critically to highlight its shortcomings which limit its reliability and application. 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 aid and non-military aid are 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 only to the US aid to Pakistan, whereas, Pakistan is a multilateral aid recipient. Hence, the

outcomes of the study fail to assist in chalking out broader fiscal policy in the presence of aid inflows to the country. Studies by Chishti and Hasan (1992) and Otim (1996) apply the Heller's model to Pakistan for investigating the relationship between foreign economic assistance and budgetary response but ignore to account for the limitations of the Heller's model which are well documented in the fiscal response literature (see, for instance, Binh and McGillivray, 1993; White, 1994; McGillivray and Morrissey,2001). Considering this we have adopted a modified version of the fiscal response model keeping in view the deficiencies associated with the Heller's model.

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 to aid 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. However, the findings of the study are questionable for three reasons. Firstly, the study has a very small sample size, which is not desirable to conduct a time series analysis. Secondly, the study does not disaggregate aid variable in terms of either grants and loans or program aid and project aid. Finally, the study assumes that domestic borrowing is allocated only for development purposes, which does not coincide with the actual fiscal practice of the government of Pakistan.

To quantify the role of aid in shaping fiscal behaviour in Pakistan, Franco-Rodriguez et al. (1998) have estimated a fiscal response model that treats aid as an endogenous variable. The inquiry spans the years 1956 through 1995. A number of structural and reduced form equations have been derived and estimated. The study's outcomes divulge that the government spends only half of aid funds on consumption; aid has a positive relationship with the public sector investment; foreign aid discourages tax effort; and aid inflows cause domestic borrowing. However, there are a number of shortcomings in this research. Firstly, it does not provide any justification for utilizing the pre-1972 data since 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 Ministry of Finance, Islamabad. 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 over the period 1956 to 1995. The study reports that 85 percent of grants; 68 percent of the tax revenue; 50 percent of loans; and 31percent 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 skeptical because the pre and post 1971 data are not compatible as pointed out earlier. Furthermore, when 11 out of 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 over 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 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's generated values of the target variable by means of a regression method are flawed as pointed out by White (1994). Furthermore, as mentioned 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 over 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 external aid. Over a period of time, the grant component is almost negligible and debt burden of loans has increased enormously. Hence, the 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.

Moreover, all the studies concerning the fiscal response to aid in Pakistan are based on an assumption that the government does not set any target for domestic borrowing. But this assumption is extremely erroneous as it does not have conformity with real fiscal actions of the government of Pakistan. Every year the government sets a particular target for its domestic borrowing in its annual budget. Therefore, due to their methodological and data issues the existing relevant studies fail to yield convincing outcomes and policy recommendations for the donors and the policy-makers in Pakistan to better utilize foreign aid. The present study is an attempt to quantify fiscal response to foreign aid analysis for Pakistan in an empirically sound way.

3. Analytical Framework

3.1. The Model

Although aid-growth nexus has attracted huge volume of researches wherein focus is on identifying the role of foreign aid in bringing variations in the productive capacity of the less developed economies yet fiscal response to aid aspect could not gain due attention in this literature. It is well known that the amount of aid first becomes a part of national

treasury in the developing countries. Due to fungibility problem, a fraction of aid goes to other spending heads for which aid is not originally intended. This situation tends to affect the fiscal management of a country, which is certain to influence the macroeconomic variables of the economy including economic growth. Thus, examining the fiscal response to aid is essential to judge the aid effectiveness (McGillivery and Morrissey, 2000). In this regard Heller (1975) comes up with a fiscal response model in an econometric form which has continued to serve as the basis for the rising stock of literature in the area of fiscal response to aid. Heller assumes that his fiscal response model reflects the action of a set of decision- makers in the less developed economies. The public decision-makers strive for utility maximisation given some budget constraints. His model identifies not only the nature of association among budget aggregates it also reveals the efforts of a government to achieve certain revenue and expenditure targets.

Subsequently, Gang and Khan (1991), Khan and Hoshino (1992), Otim (1996), and Gupta et al.(2003) preferred to apply this model in their research endeavours. However, over a period of time it has been discovered that this model is plagued with some severe defects. First of all the inclusion of linear terms in the utility function makes it impossible to achieve maximum utility despite attaining target values of choice variables (Binh and McGillivray,1993). Regression based method of generating values of target variable as presented by Heller is rejected on the ground that it is certain to create an issue of consistency between targets so computed and budget constraints (White, 1994). Additionally, in a developing state like Pakistan the government usually does not allocate domestically borrowed funds to its development programs only which is absolutely in contrast to the one of the core assumptions of the Heller's model. Finally, it is a standard practice in Pakistan and other such like countries that their governments set some annual targets for domestically borrowed capital but Heller has built his model negating this reality. The above-mentioned deficiencies in the Heller's model have significantly brought down its value and attraction as fundamental tool of examining role of foreign aid flows in shaping fiscal actions in aid recipients. Since 1990s the researchers have engaged in developing some modified fiscal response models to better investigate the budget response to aid (see, for instance, Binh and McGillivery,1993; White,1994; McGillivray, 2000; Mavrotas and Ouattara, 2003). Consequently, for a valid and meaningful fiscal response analysis it is required that some

better alternative of the Heller's model ought to be employed. The present study is a move in this direction.

The task of public decision-makers in Pakistan is to allocate revenues among   expenditure categories subject to budgetary constraints. It is assumed that they reflect their   preferences through the following utility function:

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

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 approach in the fiscal response literature the utility function (1) can be represented as a quadratic loss function:

$$U = \beta_0 - \frac{\beta_1}{2}(D-D^*)^2 - \frac{\beta_2}{2}(T-T^*)^2 - \frac{\beta_3}{2}(S-S^*)^2 - \frac{\beta_4}{2}(C-C^*)^2 - \frac{\beta_5}{2}(B-B^*)^2 \quad (2)$$

where the asterisks show exogenous targets of endogenous variables and $\beta_i \geq 0$ for $i = 1,...,5.$ From utility function (2) it transpires that the government of Pakistan sets targets for revenue and expenditure categories every year and it makes efforts to achieve these targets. Any deviation from these targets leads to loss in utility. The public decision-makers face the following two budget constraints which are pivotal in utility maximization process:

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

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

where, $0 < \rho_i < 1$ for all *is* (*i* = 12,22,32,42) and

$1 - \rho_{12}$:   share of tax earmarked for development spending;
$1 - \rho_{22}$: proportion of aid loans allocated for development spending;
$1 - \rho_{32}$: part of aid grants reserved for development spending;
$1 - \rho_{42}$:   share of domestically borrowed fund for financing development spending.

Contrary to all fiscal response studies related to Pakistan, we have dropped the assumption that public decision-makers set zero target for domestically borrowed money because it does not coincide with the real situation prevailing in the country. For maximizing (2) subject to (3) and (4) results in the following Lagrangian function:

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

(5)

where λ_1 and λ_2 are Lagrange multipliers. The solution of the first order conditions obtained from the Lagrangian function (5) yields the following system of structural equations:

$$C = \phi_1(\rho_{12}T + \rho_{22}L + \rho_{32}G + \rho_{42}B) - \phi_1 S^* + \phi_2 C^* \tag{6}$$

$$S = (1 - \phi_1)(\rho_{12}T + \rho_{22}L + \rho_{32}G + \rho_{42}B) - \phi_2 C^* + \phi_1 S^* \tag{7}$$

$$D = \gamma_1(\rho_{41})^2 D^* + \gamma_2(\rho_{11}T + \rho_{21}L + \rho_{31}G + \rho_{41}B^*) - \gamma_3\rho_{41}\rho_{42}(S - S^*) \tag{8}$$

$$T = \phi_3 T^* - \phi_5 L - \phi_6 G - \phi_4 B + \phi_8\rho_{11}D^* + \phi_7\rho_{12}(S^* + C) \tag{9}$$

$$B = \delta_1 B^* - \delta_3 T - \delta_5 L - \delta_6 G + \delta_4\rho_{41}D^* + \delta_2\rho_{42}(C + S^*) \tag{10}$$

Equations (6) to (10) level the ground for gauging role of foreign aid in shaping budgetary actions in Pakistan. However, they can provide direct impact of given categories of revenue variables including foreign aid on three types of government spending. The following reduced form equations are derived from the set of structural equations (6) to (10) to have total impact (direct and indirect) analysis:

$$C = \Theta_1 T^* + \Theta_2 B^* + \Theta_3 S^* + \Theta_4 L + \Theta_5 G + \Theta_6 D^* + \Theta_7 C^* \tag{11}$$

$$B = \Theta_8 B^* + \Theta_9 T^* + \Theta_{10} S^* + \Theta_{11} L + \Theta_{12} G + \Theta_{13} D^* + \Theta_{14} C^* \tag{12}$$

$$T = \Theta_{15} T^* + \Theta_{16} B^* + \Theta_{17} S^* + \Theta_{18} L + \Theta_{19} G + \Theta_{20} D^* + \Theta_{21} C^* \tag{13}$$

$$S = \Theta_{22} S^* + \Theta_{23} C^* + \Theta_{24} T^* + \Theta_{25} B^* + \Theta_{26} L + \Theta_{27} G + \Theta_{28} D^* \tag{14}$$

$$D = \Theta_{29} D^* + \Theta_{30} T^* + \Theta_{31} B^* + \Theta_{32} S^* + \Theta_{33} L + \Theta_{34} G + \Theta_{35} C^* \tag{15}$$

3.2. Data and Econometric Methodology

The fiscal behaviour of the Pakistan's government in the face of aid inflows is examined using consistent time series data from 1972 to 2016. 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 shares, 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.

4. Results and Discussion

The estimated results of the structural equations (6) to (10) are reported in table 1. We begin our discussion of the results looking at the value of J test statistic and its associated probability value

Table 1. Estimates of Structural Parameters

Parameter	Estimate	t-Statistic
ρ_{12}	0.901^{***}	20.840
ρ_{22}	0.172^{***}	18.665
ρ_{32}	0.613^{***}	3.099
ρ_{42}	0.806^{***}	13.132
$\emptyset_1$	0.664^{***}	32.541
$\emptyset_2$	0.330^{***}	17.594
$\emptyset_3$	0.743^{***}	46.202
$\emptyset_4$	0.001^{*}	1.771
$\emptyset_5$	0.369^{***}	15.175
$\emptyset_6$	1.245^{***}	6.631
$\emptyset_7$	0.172^{***}	5.183
$\emptyset_8$	1.368	0.911
γ_1	0.014^{***}	17.148
γ_2	0.458^{***}	5.445
γ_3	0.328^{*}	1.748
δ_1	7.631^{***}	3.440
δ_2	0.779^{***}	3.946
δ_3	0.316^{**}	2.098
δ_4	0.116	0.235
δ_5	2.817^{**}	2.487
δ_6	0.532	0.284
J-Stats	0.259 Probability	0.971

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

given at the bottom of table 1. The value of the J test statistic is 0.259 having probability value 0.971which confirms the validity of the instruments used in estimating the model consisting of equations (6) to (10) and this outcome also points to the correct specification of the model. This finding tends to increase our confidence in the estimation strategy of the study. The estimated coefficients of budget constraint equations ρ_{12}, ρ_{22}, $\rho_{32}$and ρ_{42} are within the theoretical range i.e. between 0 and 1 which 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 carry a positive sign as expected[4].We see that the estimate of $\rho_{12} = 0.901$[coefficient of$T$] which implies that tax revenue chiefly remains in current budget such that nearly 90 percent of tax money is used to finance the public spending under current and socio-economic heads while 10percent of the taxes flows to public sector development programs. This finding implies that the availability of domestic borrowing and foreign aid persuades the public decision-makers in Pakistan to allocate more of tax money in financing the current budget. The tragedy with the country is that on one hand its overall tax to GDP ratio remained low i.e. it ranged between 9 to 14 percent approximately during the sample period of the study while on the other hand the economic management team of the country failed to make development oriented use of the tax revenue. Overall, our 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.

The estimate of ρ_{22} [coefficient of L] is 0.172 which indicates that almost 17 percent of foreign loan goes to current and socio-economic expenditure

---

[4]To have consistency between a theoretical fiscal response model and its empirical results the coefficients of budget constraint equations ρs must lie between 0 and 1 while all the structural parameters must be positive (McGillivray and Outtara, 2005; Feeny and McGillivray, 2010). Unfortunately, most of the existing studies related to the fiscal response overlooked this consistency condition.

in Pakistan. This finding clearly conveys that the aid loans have predominantly development-oriented use (i.e. just about 83 percent of aid loans is allocated to public sector investment) in the country as the donors are more concerned about the recovery of their loans so they try to make it sure to see flowing of the loans to development related projects which will generate returns in future. Similar evidence has been documented by some previous studies related to various developing countries including Pakistan (see, for example, Heller, 1975; Khan and Hoshino 1992; Otim, 1996; McGillivray, 2000; Ouattara, 2006a; Martins, 2007; Senbet and Senbeta, 2009; Feeny and McGillivray, 2010). Nonetheless, Feeny (2007) reports a contradictory finding for Melanesia[5] where aid loans are mainly used in financing current public spending.

The estimate of ρ_{32} [coefficient of G] is0.613 which suggests that nearly 61 percent of foreign grants is used in funding non-development spending. Only 39 percent of their share is going to the public sector development projects in the country. This outcome corroborates earlier findings by Heller (1975), Khan and Hoshino (1992),Otim (1996), McGillivray (2000),Ouattara (2006b),Martis (2007),Senbet and Senbeta (2009),and Feeny and McGillivray(2010).

Finally, value of the regression coefficient of domestic borrowing (ρ_{42} is 0.806) which indicates that major chunk [nearly 81 percent] of the domestically borrowed fund is consumed by current and socio-economic spending which leaves a small share of 19 percent for public sector investment in the presence of foreign aid. This result reflects the real tragedy with Pakistan that domestic public debt is mounting day by day without causing a noteworthy increase in the productive capacity of the economy. When domestically borrowed money is primarily earmarked for non-development category of expenditure, it cannot play its due role in improving economic growth performance through increasing volume of public sector investment. This finding is akin to that of Mavrotas and Ouattara (2003) and Mavrotas (2005).

As the aim of the study is to estimate fiscal response to aid in Pakistan, we skip the interpretation of the structural parameters (i.e.ϕs,γs and δs)given in table 1. It does not mean that these parameters are of no use in

---

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

our study. Indeed, they play their role in determining incremental direct impact of aid and other revenue variables on different endogenous variables of the fiscal response model. For this incremental analysis, we have substituted the values of all the parameters given in table 1 into the system of structural equations (5) to (10) and the results are reported in table 2.

With regard to aid loans, it can be seen that their association with non-development spending in Pakistan is not reasonably large because on average every rupee of loans leads to increase current and socio-economic expenditure by 0.114 rupee and 0.058 rupee respectively. The whole direct impact of loans on non-development expenditure is estimated to be 0.172 which is associated with one rupee increase in aid loans. Foreign loans largely tend to enhance the volume of public sector development spending as due to one rupee of loans an increase of 0.379 rupee in development expenditure takes place in the country. This finding reflects correct strategy of the government economic management team to divert aid loans mainly towards development programs so that the desired aim of improving growth performance in the economy through foreign loans can be made possible. It also implies that even when the government sets some positive target for domestic borrowing, it continues to earmark foreign loans largely in its development projects.

Table 2. Incremental Impact Results

Impact	Mechanism	Estimate
L on C	$\emptyset_1 \rho_{22}$	0.114
L on S	$(1-\emptyset_1)\rho_{22}$	0.058
L on D	$\gamma_2(1-\rho_{22})$	0.379
L on T	$-\emptyset_5$	0.369
L on B	$-\delta_5$	-2.817
G on C	$\emptyset_1 \rho_{32}$	0.407
G on S	$(1-\emptyset_1)\rho_{32}$	0.206
G on D	$\gamma_2(1-\rho_{32})$	0.177
G on T	$-\emptyset_6$	-1.245
G on B	$-\delta_6$	- 0.532
T on C	$\emptyset_1 \rho_{12}$	0.598
T on S	$(1-\emptyset_1)\rho_{12}$	0.303
T on D	$\gamma_2(1-\rho_{12})$	0.045
T on B	$-\delta_3$	- 0.316
B on C	$\emptyset_1 \rho_{42}$	0.535
B on S	$(1-\emptyset_1)\rho_{42}$	0.271
B on T	$-\emptyset_4$	-0.001

For the direct impact of aid grants it is apparent that this component of foreign economic assistance principally funds the current and socio-economic expenditures. One rupee of grants is associated with 0.407 rupee and 0.206 rupee increase in current and socio-economic expenditures respectively. It implies that on average one rupee of grants is associated with 0.613 rupee increase in non-development spending. Nonetheless, each additional rupee in the form of aid grants leads to enhance development spending by 0.177 rupee. Hence, it is evident that grants affect both the development and non-development expenditures in Pakistan though their direct impact is larger in case of latter as compared to the former. This outcome suggests the unwise strategy of the decision-makers in Pakistan as they drastically failed to enhance the contribution of grants in development programs.

We see that both the components of foreign aid have an adverse impact on tax revenue collection in Pakistan. Their direct effect is quite noticeable and especially foreign grants have emerged as bringing

substantial reduction in tax collection efforts against foreign loans. This finding again proves that foreign aid is one of the hurdles in the way of increasing tax to GDP ratio in the country.

Finally, foreign aid has emerged as substitute for domestic borrowing as incremental impact of both the components of foreign aid is negative. Foreign loans influence the domestic borrowing more than the foreign grants. One additional rupee of foreign loans leads to a decline of 2.82 rupee in domestic borrowing, whereas, an additional one rupee of foreign grants leads to bring a fall in domestic borrowing by 0.53 rupee. This relationship between foreign aid and domestic borrowing is theoretically reasonable and understandable because as long as the   government has the opportunity to get foreign loans, it is least interested to go for increasing domestic borrowing. In case of Pakistan, we see that domestic interest rate is higher than the interest rate on foreign loans, therefore, whenever government has the opportunity to get foreign loans it is not interested in domestic borrowing. Foreign loans result in increased inflow of foreign exchange which is always considered to be a blessing for developing countries like Pakistan.

The direct impact of taxes on non-development expenditure is quite noticeable as every additional rupee of tax revenue brings an increase of 0.598 rupee and 0.303 rupee in current and socio-economic heads of expenditure in the country. In other words, it can be stated that on average with one rupee increase in tax collection there will occur 0.901 rupee increase in current and socio-economic expenditures. On the other side the direct impact of taxes on public sector development spending is negligible i.e. one rupee of tax revenue is associated with 0.012 rupee increase in development spending of the government. This finding suggests that the availability of foreign capital in the form of aid persuades the decision-makers in Pakistan to make less productive use of taxes which is not a healthy signal for the future economic management of the economy. As far as the direct impact of taxes on the domestic borrowing is concerned, we see that both the variables have emerged as substitute to each other because the former is adversely related to the latter in the presence of aid inflows.

Next, we move to the case of domestic borrowing. The results are quite surprising that domestic borrowing has appreciable and greater incremental impact on the non-development activities in Pakistan. Hence,

the role of domestic borrowing in enhancing public sector development programs in the country is minimal. This clearly indicates that non-development needs of the government are mainly met through domestic borrowings which create a serious problem with regard to the use of domestic debt at the government level. This has led to the phenomenal rise in domestic debt as well as poor economic growth performance of the country. The direct incremental impact of domestic borrowing on tax revenue collection is negative which implies that the availability of domestic loans to meet its needs blunts government actions to bring an increase in tax to GDP ratio. In other words, we can say that the governments in Pakistan have deliberately kept the tax to GDP ratio low and they continue to increase domestic borrowing for meeting their spending requirements.

The outcomes contained in table 2 are obviously partial to the extent that they overlook indirect feedbacks, working through the simultaneous system of structural equations. Of more prominent policy pertinence are the total, direct and indirect, impacts of exogenously determined changes in foreign aid on three categories of public spending, taxation and domestic borrowing as shown by the reduced equation parameters. Table 3 exhibits the results.

Table 3. Total Impact of Foreign Aid

Impact	Parameter	Estimate
L on C	Θ_4	0.016
L on S	Θ_{26}	0.170
L on D	Θ_{33}	0.311
L on T	Θ_{18}	-0.273
L on B	Θ_{11}	-0.108
G on C	Θ_5	0.065
G on S	Θ_{27}	0.719
G on D	Θ_{34}	0.022
G on T	Θ_{19}	-1.786
G on B	Θ_{12}	-0.101

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

First, we analyze the total effect of foreign loans on three types of public spending categories along with tax revenue and domestic borrowing. It transpires from table 3 that total effect of loans on current spending, socio-economic spending and development spending is positive but it is less than its direct impact in case of current spending and development spending. However, it tends to go up in case of socio-economic spending vis-à-vis its direct impact. Furthermore, the total impact of loans on public sector development expenditure still dominates its impact on non-development expenditure in Pakistan. This finding again underlines the development-oriented use of aid loans in the country. The signs of estimated reduced form aid loans parameters are negative in case of tax revenue and domestic borrowing which implies that total effect of loans is adverse for tax revenue and domestic borrowing. However, the extent of negative effect is less in case of tax revenue but more in case of domestic borrowing as compared to the direct impact analysis. The 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 mainly go to the non-development spending sides of the budget. Total negative impact of grants on tax revenue exceeds its direct effect on its counterpart. Finally, total impact of grants on domestic borrowing is negative but its extent is less than that of direct impact case.

5. Conclusion and Policy Recommendations

Pakistan is an exemplary case for a foreign aid dependent country because since its emergence as a sovereign state on the world map in 1947 the nation has been relying on foreign economic assistance for improving its developmental outlook. This study, using a modified version of the Heller's (1975) fiscal response model, shows that foreign aid is a significant driver of moulding the public spending, tax revenue collection and domestic borrowing in the country. By disaggregating foreign aid into aid loans and aid grants, the study has succeeded in identifying separate impact of both the components of aid on budgetary response in Pakistan. Aid loans are mainly earmarked for public sector development projects whereas foreign grants are largely channelled to non-development public spending. This outcome indicates that the decision-makers in Pakistan are quite cautious about the use of aid loans but they are making non-productive use of aid grants. With regard to tax revenue response to aid, it has been found that aid is a tax effort discouraging agent in Pakistan as

both the constituents of aid affect tax revenue collection unfavourably. This finding reflects the approach of the policy-makers in Pakistan; when aid is available, there is no need to bring the nation under more tax burden. Instead, in the presence of aid more and more tax concessions are provided and nobody at the public decision-making level contemplates future prospect of rise in foreign debt and fall in tax revenue in terms of tax to GDP ratio. Finally, foreign aid has led to a crowding out of the domestic borrowing in Pakistan. This result indicates that the government of Pakistan considers aid and domestic borrowing as substitutes, and economic wisdom supports this type of finding and thinking. Non-development expenditures in Pakistan are chiefly met from tax revenue and domestic borrowing, while tax revenue and domestic borrowing are substitutes.

The findings of the study lead to three key policy recommendations. Firstly, as Pakistan is unable to make full productive use of foreign economic assistance because a significant portion of it is used to meet non-development expenditures. The current pattern of aid use should be modified so that more foreign aid allocations are made in order to increase the size and level of public sector investment in the country. Secondly, the negative association between foreign aid inflows and tax revenue effort indicates that government can revise its current fiscal management strategy such that tax to GDP ratio can be raised and the government's dependence on foreign aid can be reduced. To this end, the best policy will be to concentrate heavily on proper documentation of the economy in order to expand the country's tax base. Finally, since foreign economic assistance has been shown to be fungible, donors should provide it in the least fungible type of public expenditure. Moreover, both donors and the government of Pakistan should put in place controls to restrict the extent of fungibility. Another option to donors may be to tie all aid to very specific projects or expenditure categories.

References

Ahmed, S.(2002). Impact of aid on fiscal behaviour: A case study of Pakistan (1980-2000). *The Lahore Journal of Economics*, 7(1), 117-124.

Bacha, E.L. (1990). A three-gap model of foreign transfers and the GDP growth rate in developing countries. *Journal of Development Economics*, 32, 279–296.

Bakhtiari, S., Izadkhasti, H., & Tayebi, S.K. (2013). Crowding out effect of foreign aid in selected developing countries: Panel data evidence. *Iranian Economic Review,* 17(2),35-50.

Binh, T.N., & McGillivray, M. (1993). Foreign aid, taxes and public investment: A comment. *Journal of Development Economics*, 41, 173-176.

Butt, R., & Javed, A.Y. (2013). Foreign aid and the fiscal behaviour of Government of Pakistan. PIDE Working Paper No. 96, Islamabad.

Bwire, T., Lloyd, T., & Morrissey, O. (2017). Fiscal reforms and the fiscal effects of aid in Uganda. *The Journal of Development Studies*, 53, 1019-1036.

Chenery, H. B., & Strout, A. M. (1966). Foreign assistance and economic development. *The American Economic Review*, 56, 680-733.

Chenery, H. B., & Bruno, M. (1962). Development alternatives in an open economy: The case of Israel. *The Economic Journal*, 72(285), 79-103.

Chishti, S., & Hasan, M.A. (1992). Foreign aid, defence expenditure and public investment in Pakistan. *The Pakistan Development Review*, 31(4),895-908.

Clist, P., & Morrissey, O. (2011). Aid and tax revenue: Signs of a positive effect since the 1980s. *Journal of International Development*, 23, 165-80.

Dayanath, D., & Ichihashi, M. (2013). Fiscal policy and economic growth in presence of foreign aid [the Sri Lankan experience]. IDEC Discussion Paper No. 11, Hiroshima University, Japan.

Erden, L., & Guven, A. (2009). The impact of aid on the fiscal behaviour of governments in transition economies. *Ekonomickýčasopis Journal of Economics*, 57(5), 445-457.

Feeny, S. (2007). Foreign aid and fiscal governance in Melanesia. *World Development*, 35, 439-453.

Feeny, S., & McGillivray, M. (2010). Aid and public sector fiscal behaviour in failing states. *Economic Modelling*, 27, 1006-1016.

Franco-Rodriguez, S., McGillivray, M., & Morrissey, O. (1998). Aid and the public sector in Pakistan: evidence with endogenous aid. *World Development*, 26, 1241–1250.

Gang, I. N., & Khan, H. (1991). Foreign aid, taxes, and public investment. *Journal of Development Economics*, 34, 355-369.

Gupta S., Clements, B., Pivovarsky, A., & Tiongson, E.R. (2003). Foreign aid and revenue response: Does the composition of aid matter? IMF Working Paper No.176.

Heller, S.P. (1975). A model of public fiscal behaviour in developing countries: Aid, investment and taxation. *American Economic Review*, 65, 429-445.

Hansen, L. P. (1982). Large sample properties of generalized method of moments estimators. *Econometrica: Journal of the Econometric Society*, 50, 1029-1054.

Iqbal, Z. (1997). Foreign aid and the public sector: a model of fiscal behaviour in Pakistan. *The Pakistan Development Review*, 36 (2), 115-129.

Khan, H. A., & Hoshino, E. (1992). Impact of foreign aid on the fiscal behavior of LDC governments. *World Development*, 20, 1481-1488.

Khilji, N. M., & Ampulla, E. M. (1991). The effect of us assistance on public and private expenditures in Pakistan: 1960-1988. *The Pakistan Development Review*, 30 (4), 1169–1184.

McGillivray, M. (2000). Aid and public sector behaviour in developing countries. *Review of Development Economics*, 4, 156-163.

McGillivray, M. (2009). Aid, economic reform, and public sector fiscal behavior in developing countries. *Review of Development Economics*, 13, 526-542.

McGillivray, M., & Ahmed, A. (1999). Aid, adjustment and public sector fiscal behaviour in developing countries. *Journal of Asia-Pacific Economy*, 4, 381–391.

McGillivray M., & Morrissey, O. (2000). Aid fungibility in assessing aid: Red herring or true concern? *Journal of International Development*, 12, 413–428.

McGillivray M., & Morrissey, O. (2001). Fiscal effects of aid. WIDER Discussion Paper No. 61, United Nations University, Tokyo, Japan.

Martins, P.M. (2007). The impact of foreign aid on government spending, revenue and domestic borrowing in Ethiopia. Working Paper No. 41, International Poverty Centre, Brazil.

Mavrotas, G. (2002). Foreign aid and fiscal response: Does aid disaggregation matter? *Review of World Economics*, 138, 534-559.

Mavrotas, G. (2005). Aid heterogeneity: looking at aid effectiveness from a different angle. *Journal of International Development*, 17, 1019-1036.

Mavrotas, G.,& Ouattara,B. (2003). Aid disaggregation, endogenous aid and the public sector in aid-recipient economies: evidence from Côte d'Ivoire. WIDER Discussion Paper No 15, United Nations University, Tokyo, Japan.

McGillivray, M., & Ouattara, B. (2003). Aid, debt burden and government fiscal behaviour: A new model applied to Côte d'Ivoire, WIDER Discussion Papers No. 33, United Nations University, Tokyo, Japan.

Morrissey, O. (2015a). Aid and government fiscal behaviour: What does the evidence say? *World Development*, 69, 98–105.

Morrissey, O. (2015b). Aid and domestic resource mobilisation with a focus on sub-Saharan Africa. *Oxford Review of Economic Policy*, 31(3–4), 447–461.

Otim, S. (1996). Foreign aid and government fiscal behaviour in low-income South Asian countries. *Applied Economics*, 28, 927-933.

Ouattara, B. (2006a). Foreign aid and government fiscal behaviour in developing countries: panel data evidence. *Economic Modelling*, 23, 506–514.

Ouattara, B. (2006b). Aid, debt and fiscal policy in Senegal. *Journal of International Development*, 18, 1105-1122.

Senbet, D., & Senbeta, A. (2009). Fiscal response to external finance: The case of Sub-Saharan Africa. *European Journal of Social Sciences*, 8(1), 107-123.

Swaroop, V., Jha, S., & Rajkumar, A.S. (2000). Fiscal effects of foreign aid in a federal system of governance: the case of India. *Journal of Public Economics*, 77 (3), 307-330.

White, H. (1994). Foreign aid, taxes and public investment: A further comment. *Journal of Development Economics*, 45, 155-163.