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Foreign aid, recipient government's fiscal behavior, and economic growth

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Abstract

The paper investigates the nexus between foreign aid, fiscal policy and economic outcomes in a small recipient country. Foreign aid may increase not only government expenditures but also private capital, and hence improve economic growth. However, it may also discourage the recipient's tax effort. The effects of foreign aid on fiscal policy and economic growth depend on the circumstances of the recipient country, including its development level, the TFP, the efficiency of public investment, and in particular the government's concern for the population's welfare.

JEL Classifications: H2, H5, O4

Keywords: Foreign aid, fiscal behavior, public investment, public services, economic growth.

1 Introduction

Foreign aid is an important component of public sector budget and becomes an important source of revenue for recipient countries.[1] There is an evidence that foreign aid contributes to increase public expenditures in recipient countries (see Ouattara

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[1]Foreign aid can reach up to 10% of GDP in low-income countries (http://www.oecd.org/dac/stats/development-aid-rises-again-in-2016-but-flows-to-poorest-countries-dip.htm)

(2006b), Feeny and McGillivray (2010), Morissey (2015) for instance). However, its impacts on tax effort and fiscal policy, as well as economic growth, are ambiguous. On the one hand, Combes et al. (2016) uses data from 59 developing countries over the period 1960-2010 and show that the fiscal effect of aid is stronger in countries with a low quality of governance and a low absorptive capacity. When considering a single recipient country, empirical analyses (Osei et al., 2005; Ouattara, 2006a) also show that foreign aid matters for the conduct of fiscal policy, and affects domestic borrowing. On the other hand, Ouattara (2006b) indicates that aid did not necessarily affect tax effort and tax revenue.[2] Morissey (2015) shows a similar point and evidence of aid fungibility.

Our paper aims to contribute to this debate regarding the link between foreign aid, recipient government's fiscal behavior, and economic growth by introducing foreign aid and a government in a simple model with micro-foundations. In our framework, a political-economic equilibrium is determined under a sequential process. First, given the government's policy, the representative agent maximizes her intertemporal utility by choosing consumption and investment which determines the production at the next period. Second, the government makes its decision regarding public services, public investment and the manner of use of aid when caring about its own interest and also the population's welfare. Thanks to the tractability of our model, we can explicitly compute the equilibrium and provide full comparative statics.

Our main results are the following. First, foreign aid promotes public spending (public investment and public services) but may reduce the recipient government's tax effort measured by the tax/output ratio. We also show that the negative relationship between aid flow and the tax rate is more likely to appear in low-income countries. This point is supported by empirical findings in Clist and Morrissey (2011) where they found a significant negative short-term effect of aid (in the form of grants) on the tax/GDP ratio in poor countries which have lower tax revenue and receive more aid grants.[3] It should be noticed, however, that the optimal tax rate depends not only on the aid flow but also on the recipient country's circumstances (households' preferences, the country's development level, etc.).

Second, we show that 1\$ in foreign aid increases the recipient's government spending by only R_g\$ where $R_g < 1$, and for each 1\$ in foreign aid, only a fraction $R_s < 1$ contributes to the government spending. Both R_a and R_s are increasing in the recipient government's concern for the population's welfare, which may be interpreted as a proxy of governance quality. The lower the quality of governance, the lower the ratios R_a, R_s. Since R_a, R_s depend on the recipient country's performance, our result suggests that the effects of aid on government spending and tax effort in recipient countries are country-specific; this point is consistent with empirical evidence (Morissey, 2015).

Third, foreign aid may have positive effects on economic growth. There are two reasons: (1) aid may enhance private capital thanks to a reduction of tax, and (2) aid

[2]This finding is based on a panel data of aid recipient countries over the period 1980-2000.

[3]See Morissey (2015) for an overview concerning this issue.

may promote public investment which in turns may increase the productivity. We also point out that the aid effect on economic growth positively depends on the recipient country's circumstances represented by its TFP, the efficiency of public investment and the government's concern for the population's welfare. In this sense, our paper contributes to the debate on the conditionality of growth effect of aid (Burnside and Dollar, 2000; Collier and Dollar, 2001, 2002).

2 Framework

In this section, we describe our framework and then provide a formal definition of political-economic equilibrium. Section 3 presents our main results. Technical proofs are gathered in Appendix A.

2.1 An aid recipient economy

We consider a small economy with a representative consumer-producer and a government. There are two periods ($t = 0, 1$) and there is a single traded commodity, which can be used for either consumption or investment. Her preferences for consumption and public services are represented by the following intertemporal utility function:

$$U(c_0, H_0) + \beta U(c_1, H_1) \tag{1}$$

where $\beta \in (0, 1)$ is the discount rate. c_0 and c_1 are consumptions in periods 0 and 1. Public services in two periods are represented by H_0 and H_1. H_0 is given. For the sake of tractability, we adopt a logarithmic utility

$$U(c_t, H_t) = ln(c_t) + xln(H_t), t = 0, 1 \tag{2}$$

where x is a positive parameter measuring the weight accorded to the individual satisfaction from public services (health services, sanitation, etc.).

The output y_1 at the second period is produced following a Cobb-Douglas function:

$$y_1 = F(k_1, B_1) = Ak_1^{\alpha}(\psi B_1)^{\gamma} \tag{3}$$

where $\alpha, \gamma \in (0, 1)$, k_1 and B_1 represent private and public investments at date t, respectively. Parameter A represents the TFP while ψ may be interpreted as a measure of efficiency of public investment.

We assume that the country receives an aid amount, denoted by a, at the first period. However, there is an aid waste (due to the corruption, administrative fees, etc). By consequence, there is only a part of aid a_i which is used to finance public expenditures. So, we write

$$a = a_i + a_u \tag{4}$$

The amount a_u can also be viewed as aid fungibility: aid is used to finance other spendings that the donors do not wish to support but in the recipient government's own benefit. Therefore, the ratio $\alpha_u \equiv a_u/a \in [0,1]$ may then reflect the inefficiency, corruption degree or fungibility degree in the use of aid. It is not exogenous but part of the recipient government's decision.

The government finances public investment B_1 and public services H_1 by using income tax and a part of foreign aid a_i. The government's budget constraint is

$$\underbrace{B_1 + H_1}_{\text{expenditure}} \quad \leq \quad \underbrace{\tau y_0}_{\text{tax}} \quad + \quad \underbrace{a_i}_{\text{part of foreign aid}} \tag{5}$$

2.2 Political-economic equilibrium

We study a political-economic equilibrium which results from a sequential process. At the first step, taking as given H_0, B_0, k_0, the income tax rate τ as well as the government's decision regarding public investment B_1 and public services H_1, the representative agent maximizes her utility (1) by choosing consumptions c_0, c_1 and physical capital k_1 subject to her two budget contraints:

$$c_0 + k_1 = (1-\tau)y_0, \quad c_1 = F(k_1, B_1)$$

where y_0 is the given production at the period 0 and τ is the tax rate. Solving this problem we find that

$$c_0 = \frac{1}{1+\alpha\beta}(1-\tau)y_0 \tag{6a}$$

$$c_1 = Ak_1^{\alpha}(\psi B_1)^{\gamma} = A\Big(\frac{\alpha\beta}{1+\alpha\beta}(1-\tau)y_0\Big)^{\alpha}(\psi B_1)^{\gamma} \tag{6b}$$

$$k_1 = \frac{\alpha\beta}{1+\alpha\beta}(1-\tau)y_0. \tag{6c}$$

At the second step, the government makes decision regarding the use of aid (a_i, a_u), the income tax rate τ as well as the allocation of two different categories of public expenditures H_1, B_1 by maximizing its objective function, subject to decisions taken by private sector at the first step. We assume that the government takes care of the population's welfare, but has also its own interest which depends on aid. Then, its objective function is a weighted sum of the agent's utility and a function of wasted part of aid $W(U,V) = \delta\Big(U(c_0,H_0) + \beta U(c_1,H_1)\Big) + (1-\delta)V(a_u)$. Parameter δ represents the weight that the government attributes to the population's utility. It can be also viewed as a proxy of governance quality. The government's optimization program is the following:

$$(P1): \qquad \max_{(\tau,a_u,a_i,B_1,H_1)} \delta\Big(U(c_0,H_0) + \beta U(c_1,H_1)\Big) + (1-\delta)V(a_u)$$

subject to constraints: (5), (6a), (6b), (6c), $a_i + a_u = a$, $a_u \in [0, a]$, and $\tau \in [0, 1]$. For the sake of tractability, we assume that $V(a_u) = ln(a_u)$.

3 Main results

We now study the properties of political-economic equilibrium. Thanks to the tractability of our framework, we can explicitly compute the equilibrium.

Proposition 1. *At the interior equilibrium, the government's decision is described as the following:*

$$\textit{Expenditures: } G_1 \equiv B_1 + H_1 = \frac{y_0 + a}{1 + \frac{\frac{1}{\delta\beta} + \alpha}{x + \gamma}} \tag{7a}$$

$$B_1 = \frac{\gamma}{\gamma + x} G = \frac{\gamma\big(y_0 + a\big)}{x + \gamma + \frac{1}{\delta\beta} + \alpha} \tag{7b}$$

$$H_1 = \frac{x}{\gamma + x} G = \frac{x\big(y_0 + a\big)}{x + \gamma + \frac{1}{\delta\beta} + \alpha} \tag{7c}$$

$$\textit{Tax: } \tau = 1 - \frac{(1 + \alpha\beta)}{\beta(x + \gamma + \frac{1}{\delta\beta} + \alpha)}\Big(1 + \frac{a}{y_0}\Big) \tag{7d}$$

$$\textit{Use of aid: } a_i = \Big(1 - \frac{1 - \delta}{\delta\beta(x + \gamma) + 1 + \alpha\delta\beta}\Big)a - \frac{1 - \delta}{\delta\beta(x + \gamma) + 1 + \alpha\delta\beta} y_0. \tag{7e}$$

Proof. See Appendix A. □

We focus here on an interior solution and assume that the right hand sides (RHS) of (7d) and (7e) are positive. We can prove that, if the RHS of (7d) is negative then $\tau = 0$ at optimal (this happens when a is high enough). If the RHS of (7e) is negative then $a_i = 0$ at optimal (this happens when a is low enough).

We firstly observe a significant impact of individual preference for public services (x) on the government's decision. Indeed, if individuals attribute an important weight to public services H_1, then the government will increase the income tax rate τ. This explains a positive effect of x on overall public expenditures G_1 as G_1 is financed by income tax revenue and a part of received aid. However, we observe a negative effect of x on public investment B_1, this is consistent with a negative effect of x on economic growth g as we will show in Proposition 3.

We now present our main points concerning the impacts of foreign aid on the recipient's government behavior and its economic growth.

Proposition 2 (foreign aid and fiscal behavior)**.** *At the political-economic equilibrium, we have the following properties.*

1. $\frac{\partial G}{\partial a} = \frac{x+\gamma}{x+\gamma+\frac{1}{\delta\beta}+\alpha} \in (0, 1)$, $\frac{\partial H_1}{\partial a} = \frac{x}{x+\gamma+\frac{1}{\delta\beta}+\alpha} \in (0, 1)$, *and* $\frac{\partial B_1}{\partial a} = \frac{\gamma}{x+\gamma+\frac{1}{\delta\beta}+\alpha} \in (0, 1)$.

2. *The optimal tax rate* τ *is decreasing in aid flow:* $\frac{\partial \tau}{\partial a} = -\frac{(1+\alpha\beta)}{\beta(x+\gamma+\frac{1}{\delta\beta}+\alpha)}\frac{1}{y_0} < 0$.

3. $\frac{\partial a_i}{\partial a} = 1 - \frac{1-\delta}{\delta\beta(x+\gamma)+1+\alpha\delta\beta} \in (0,1)$.

According to point 1, foreign aid promotes public spendings (H_1, B_1, G_1). Our theoretical results consolidate the empirical findings. Indeed, Feeny and McGillivray (2010) analyze the case of Papua New Guinea using the data for the period 1969 to 2000, and shows that foreign aid contributed to increase consumption and investment expenditures even it negatively affects tax revenue. A significant effect of foreign aid on the recipient fiscal policy is also supported by other empirical studies such as Osei et al. (2005), Ouattara (2006a,b), Morissey (2015). Gomanee et al. (2005) provide evidence that aid increases spending on social sectors (health, education, and sanitation). This is consistent with the fact that H_1 is increasing in aid flow (a) in our model.

Point 2 of Proposition 2 indicates that a more generous amount of aid may decrease the optimal tax rate τ and hence the tax revenue τy_0. In other words, foreign aid may reduce recipient governments' effort in the short-run. Observe that the lower the initial output y_0, the lower the ratio $\partial\tau/\partial a$. It means that the negative relationship between aid flow and the tax rate is more likely to appear in low-income countries. This is consistent with the findings in Clist and Morrissey (2011) where they found a significant negative short-term effect of aid (in the form of grants) on the tax/GDP ratio in poor countries having a lower tax revenue and receiving high aid grants.[4] Although we focus on the effect of aid, it is useful to remind that the optimal tax rate given by (7d) which is endogenous, depends on the recipient country's circumstances. In particular, it is increasing in the development level of the country (represented by the initial output y_0).

Point 1 of Proposition 2 also shows that 1\$ in aid may increase government spending by R_g\$ where $R_g \equiv \frac{x+\gamma}{x+\gamma+\frac{1}{\delta\beta}+\alpha} < 1$. Moreover, point 3 indicates that, for each 1\$ in aid, only a fraction $R_s \equiv 1 - \frac{1-\delta}{\delta\beta(x+\gamma)+1+\alpha\delta\beta}$ contributes to the recipient government spendings. It suggests that foreign aid is fungible (Morissey, 2015). Notice that both R_a and R_s are increasing in δ which may be interpreted as a proxy of governance quality. The lower the quality of governance is (proxied by δ), the lower the ratios R_a, R_s. This insight is supported by empirical evidences in Combes et al. (2016).

When the government only cares about the population's welfare (i.e., $\delta = 1$), then there is no waste ($R_s = 1$ or equivalently $a_u = 0$) but the ratio R_g is still less than 1. The reason is that part of foreign aid also goes to private capital as we will show in the following result.

Proposition 3 (foreign aid and economic growth)**.** *The physical capital, output of and*

[4]It should be noticed, however, that Clist and Morrissey (2011) also find no robust evidence for a negative effect of aid grants on the tax/GDP ratio. See Morissey (2015) for a review concerning this issue.

growth rate of the recipient country are given by:

$$k_1 = \frac{\alpha\big(y_0 + a\big)}{x + \gamma + \frac{1}{\delta\beta} + \alpha} \tag{8a}$$

$$\textit{Output:} \quad y_1 = A\alpha^{\alpha}(\psi\gamma)^{\gamma}\Big(\frac{y_0 + a}{x + \gamma + \frac{1}{\delta\beta} + \alpha}\Big)^{\alpha+\gamma} \tag{8b}$$

The growth rate $g \equiv \frac{y_1}{y_0} - 1$ *is increasing in aid flow* (a)*, and*

$$\frac{\partial g}{\partial a} = A\alpha^{\alpha}(\psi\gamma)^{\gamma}\frac{(\alpha+\gamma)(y_0+a)^{\alpha+\gamma-1}}{\big(x + \gamma + \frac{1}{\delta\beta} + \alpha\big)^{\alpha+\gamma} y_0} \tag{9}$$

which is increasing in A*,* ψ *and* δ*.*

Proof. (8a) is obtained by combining (7d) and (6c). Since we have computed k_1 and B_1, we can easily prove (8b) by using (3). □

Proposition 3 shows the interplay between foreign aid and economic growth of the recipient country. When aid flow increases, as we have seen in Proposition 2, the optimal tax rate decreases, and by consequence, the physical capital k_1 increases. Moreover, foreign aid has a positive effect on the public investment B_1. By consequence, the output y_1 and hence the rate of growth are increasing functions of aid.

According to (9), we also observe that the aid effect on economic growth will be stronger when it is accompanied by a higher TFP A or higher efficiency of public investment (ψ) or a higher government's concern (δ) for the population's welfare. If we consider the recipient country's performances (proxied by ψ, A, δ) as a condition for a country to receive aid, this conditionality might help to perform the aid effect in recipient countries. This finding contributes to the debate on the conditionality of growth effect of aid (Burnside and Dollar, 2000; Collier and Dollar, 2001, 2002).

A Appendix: Proof of Proposition 1

We can express the objective function of the program (P1) as follows:

$$\begin{aligned} W(U,V) &= \delta\Big(U(c_0,H_0) + \beta U(c_1,H_1)\Big) + (1-\delta)V(\alpha_u a) \\ &= w + \delta(1+\alpha\beta)ln(1-\tau) + \delta\beta\Big(\gamma ln(B_1) + xln(H_1)\Big) + (1-\delta)ln(\alpha_u) \end{aligned}$$

where w is independent of considered variables $(\tau, \alpha_u, \alpha_i, B_1, H_1)$:

$$w \equiv \delta x ln(H_0) + (1-\delta)ln(a) + \delta ln\Big(\frac{y_0}{1+\alpha\beta}\Big) + \delta\beta ln\Big(A\Big(\frac{\alpha\beta y_0}{1+\alpha\beta}\Big)^{\alpha} m^{\gamma}\Big). \tag{A.1}$$

Thus, the problem (P1) is equivalent to the following problem

$$\max_{(\tau,\alpha_u,B_1,H_1)} \delta(1+\alpha\beta)ln(1-\tau)+\delta\beta\big(\gamma ln(B_1)+xln(H_1)\big)+(1-\delta)ln(\alpha_u) \qquad (P2)$$

$$\text{subject to: } \begin{cases} B_1+H_1 \le \tau y_0+(1-\alpha_u)a \\ \alpha_u \in [0,1], \tau \in [0,1] \end{cases}$$

Thanks to Inada conditions, we have $1-\lambda>0$ and $\alpha_u>0$ at optimal. So, we write the Lagrange function of the optimization problem (P2) as follows

$$\begin{aligned} L =&\delta(1+\alpha\beta)ln(1-\tau)+\delta\beta\big(\gamma ln(B_1)+xln(H_1)\big)+(1-\delta)ln(\alpha_u) \\ &+\mu(\tau y_0+(1-\alpha_u)a-B_1-H_1)+\lambda_1\tau+\lambda_2(1-\alpha_u) \end{aligned} \qquad (A.2)$$

where $\lambda_1,\lambda_2 \ge 0$. The first-order conditions (FOC) are:

$$\frac{\delta(1+\alpha\beta)}{1-\tau}=\mu y_0+\lambda_1, \quad \frac{1-\delta}{\alpha_u}=\mu a+\lambda_2 \qquad (A.3)$$

$$\frac{\delta\beta\gamma}{B_1}=\frac{\delta\beta x}{H_1}=\mu \qquad (A.4)$$

We now focus on interior solutions (i.e., $\tau>0$ and $\alpha_u<1$), we have $\lambda_1=\lambda_2=0$ at optimal. So, FOCs imply that:

$$\frac{\delta(1+\alpha\beta)}{1-\tau}=\mu y_0, \quad \frac{1-\delta}{\alpha_u}=\mu a \qquad (A.5)$$

Equation (A.4) implies that $\mu=\frac{\delta\beta(x+\gamma)}{B_1+H_1}=\frac{\delta\beta(x+\gamma)}{G_1}$. Thus, we get that

$$\tau=1-\frac{\delta(1+\alpha\beta)}{\mu y_0}=1-\frac{\delta(1+\alpha\beta)}{y_0\frac{\delta\beta(x+\gamma)}{G_1}}=1-\frac{(1+\alpha\beta)G_1}{y_0\beta(x+\gamma)} \qquad (A.6)$$

$$\alpha_u=\frac{1-\delta}{\mu a}=\frac{1-\delta}{a\frac{\delta\beta(x+\gamma)}{G_1}}=\frac{(1-\delta)G_1}{a\delta\beta(x+\gamma)}. \qquad (A.7)$$

The government's budget constraint implies that

$$G_1=\tau y_0+(1-\alpha_u)a=y_0\Big(1-\frac{(1+\alpha\beta)G_1}{y_0\beta(x+\gamma)}\Big)+\Big(1-\frac{(1-\delta)G_1}{a\delta\beta(x+\gamma)}\Big)a \qquad (A.8)$$

$$\Leftrightarrow G_1\Big(1+\frac{(1+\alpha\beta)}{\beta(x+\gamma)}+\frac{(1-\delta)}{\delta\beta(x+\gamma)}\Big)=y_0+a \Leftrightarrow G_1=\frac{y_0+a}{1+\frac{\frac{1}{\delta\beta}+\alpha}{(x+\gamma)}}. \qquad (A.9)$$

Therefore, we can compute the tax rate

$$\tau=1-\frac{(1+\alpha\beta)G_1}{y_0\beta(x+\gamma)}=1-\frac{(1+\alpha\beta)}{\beta(x+\gamma)+\beta(\frac{1}{\delta\beta}+\alpha)}\frac{y_0+a}{y_0} \qquad (A.10)$$

and the inefficiency in the use of aid

$$\alpha_u = \frac{(1-\delta)G_1}{a\delta\beta(x+\gamma)} = \frac{(1-\delta)}{a\delta\beta(x+\gamma)} \frac{y_0+a}{1+\frac{\frac{1}{\delta\beta}+\alpha}{(x+\gamma)}} = \frac{1-\delta}{\delta\beta(x+\gamma)+1+\alpha\delta\beta}\frac{y_0+a}{a}. \quad \text{(A.11)}$$

From the FOC (A.4), we can compute the value of public investment B_1 and public services H_1 as showed in equations (7b) and (7c). Finally, condition $\tau > 0$ (resp., $\alpha_i > 1$) is equivalent to the right hand side of 7d) (resp., (7e)) is positive.

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