



# Impact of health aid in developing countries: The public vs. the private channels

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## ARTICLE INFO

### Article history:

Accepted 10 January 2013

### Keywords:

Foreign aid  
Public health  
Policy coordination  
International organizations  
Regulation  
Panel data models

## ABSTRACT

This paper examines the efficient allocation of international health aid. We built a simple macroeconomic model which considers an endogenous allocation of aid mixed between the public and the private channels. We derive a non-cooperative interaction-game involving the private sector, the donor and the recipient government. We compare the equilibrium of the game to the optimal level of health aid allocation, showing a gap between both. The empirical analysis is based on the Institute for Health Metrics and Evaluation (IHME) and World Health Organization (WHO) data sets using dynamic panel data model with fixed effects (system-GMM). Our results show that health aid actually reduces adult mortality in developing countries. Furthermore, we show that the actual allocation of aid-mix between government and private channels is not health efficient and there is room for reallocation.

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## 1. Introduction

Health aid has increased dramatically over the years as rich countries give billions of dollars every year (\$26.87 billion in 2010) to developing countries. Total health aid, increased almost five times from a volume of \$5.6 billion to \$26.87 billion over the period 1990–2010 (IHME, 2010). There has been an increase in private funding for global health, which is said to now account for about a quarter of all health aid (Bloom, 2007). Research on health aid has expanded rapidly at the start of the last decade. First, large amounts have been made available both for foreign aid in general and health aid in particular,<sup>1</sup> partly motivated by the rise of the HIV/AIDS epidemic in sub-Saharan Africa. Second, private philanthropy and public-private partnerships for global health have emerged as new players in the previous decade. Large-scale contributions by many multimillionaires helped to establish new private foundations, for instance Bill and Melinda Gates Foundation. This has led to significant changes in the composition of health aid. In the 2000s, bilateral and multilateral public donors are still the most prominent aid intermediaries but the role of NGOs and private foundations increased. Last, the “global health” movement has become an important driving force for aid with a powerful voice for prioritizing health. The importance of health

objectives within the eight Millennium Development Goals is only an example.

The transfer of development funds links a donor to a recipient country, in the formal goal of increasing population's health. Nevertheless, more spending on health does not automatically improve health. Hence, we study the impact of equilibrium allocation health aid channelized through government and private sectors on health to see whether donors and recipients are getting value for the health money invested. We develop a simple macroeconomic framework, illustrating the game process of allocation of health aid, with three players; the donor, the aid recipient government and the households. The aid recipient government is assumed to maximize GDP subject to his own resources. The donor is assumed to maximize a population health objective by allocating donations between government and private sector i.e. donor can disburse donation through public channel or through private channel (NGOs) or use a mix of two. Two types of equilibrium are studied. The first one focuses on the interactions between donor and a government when there is no cooperation. The second, the optimal program, assumes that a unique planner is able to allocate aid with taking into account the consecutive level of the tax rate (as if the donor knows the government policy).

The analysis of the aid allocation process and the interaction between the players allow us in focusing on one important aspect, the heterogeneity of channels through which donor disburses health aid. Through mix of aid, donors may try to influence the government's decision of the recipient country and expect to get positive results of their donations. In this paper, we show that allocation of aid through public/private mix when there is no cooperation between recipient government and donor can generate a sub-optimal equilibrium and then a room for reallocation.

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<sup>1</sup> Sub-Saharan Africa received 70% of the total official development assistance from bilateral donors and 30% from multilateral agencies between 1990 and 2008. Health aid increased remarkably between 1995 and 2007, to reach 65 billions in 2007. However, with the financial crisis of 2008, there are concerns that global health funding will be flat-lined or even reduced in the next future.

The empirical part of the paper is based on the IHME and WHO data sets. Our results show that the actual allocation of aid-mix between government and private channels is not health efficient, a result that we can link to our theoretical modeling. Statistical analysis suggests that reallocation of aid in favor of the private sector would be needed.

To summarize, the structure of the paper is as follows. Section 2 links the relevant literature on health aid. In Section 3, we model the strategic interactions between donor and aid recipient government. Section 4 discusses the empirical results. Section 5 concludes.

## 2. Related literature

Health aid is widely believed to improve health outcomes in developing countries, although its actual effect on health outcomes can be associated with the enduring debate over aid effectiveness in general. Critics argue that aid can adversely affect a country's competitiveness (Rajan and Subramanian, 2005) and overwhelm the management capacity of governments (Kanbur et al., 1999). However, supporters are of the view that aid is effective when policies are good (Burnside and Dollar, 2000) and that health aid can lead to improved outcomes in poor countries through better health services delivery and relaxing resource constraints (Levine, 2004). Sachs (2006) advocates a massive scaling up of aid to help countries achieve the Millennium development Goals. Besides, the literature largely ignores the heterogeneity of aid channels used by donor countries. Schulpfen (1997) provides an earlier and more detailed comparison of Dutch ODA and co-financed aid through clerical organizations in selected Indian states. Nunnenkamp et al. (2009) seems to be the first in considering various aid channels of one particular donor country. In particular, Swiss aid statistics allow for comparing the allocation of ODA from different public sources. Indeed, they find that it depends on the source of NGOs: financially autonomous NGOs provide better targeted aid than their counterparts relying on state financing. Masud and Yontcheva (2005) examine the effect of foreign aid on poverty as measured by infant mortality and illiteracy rate, using panel data from 58 countries over the period 1990–2001. They looked at two distinct categories of aid: bilateral aid and Non-Governmental Organization (NGO) aid. They found that NGOs aid reduces infant mortality and does so more effectively than bilateral aid. On the other hand, they find no evidence that bilateral aid helps reduce infant mortality and illiteracy rates; instead it reduces government spending in education and health sectors. The differentiation between public and private aid channels is of interest in order to assess the (too naive?) view that aid channeled through NGOs is better targeted than through government – see the extensive review by Koch et al. (2009) of hypothesis related to pros and cons of NGOs aid compared to ODA. NGOs may be closer to the poor by circumventing (often corrupt) governments. Moreover, aid channeled through NGOs is less likely to be distorted by political and commercial self-interest that official donors tend to have when deciding on the allocation of ODA. On the other hand, NGOs may be reluctant to address some critical forms of poverty and to work in particularly difficult local environments. As highlighted by Nunnenkamp et al. (2009), NGOs also may have to demonstrate visible and short-term results in order to secure future funding through private donations and/or official co-financing.

## 3. The basic framework

We are interested in exploring the comparison between equilibrium (actual) and optimal (poverty/health efficient) allocations of health aid through public and private channels. In our model we assume that health level is affected by public and private expenditures on health complemented by health aid respectively. The important issue must be confronted in this set-up, allowing the distinction between health aid channelized through government

and private sector in developing countries. Our model allows aid shows of both types and demonstrates the significant differences in aggregate behavior to which they may affect health level. It is assumed that the government maximizes the GDP by raising revenue via taxes on income and adopts an optimal level. The donor's objective is to maximize health by spending through public or private channels.

In our model, there are three players the donor, the government and the households. Government levy tax on income  $Y_t$  and spends  $G_t^G$  amount on health. Donor is the source of foreign aid  $A$  which is either given to the government  $G_t^A$  or to the household  $S_t^A$  or to both. This aid is specifically for health purpose and is spent on health only. The households maximize their utility and spend their income on consumption  $C_t$  and health  $S_t^h$ : Health of household depends on the public and private spending.

The originality of our work lies in our focus on the interaction between the public and private expenditures on health supported by health aid and its macroeconomic consequences. The study is different in the sense that it employs a health production function where public and private expenditures interact in population's health outcomes. We derive the equilibrium and optimal allocations of health aid between public and private channels.

### 3.1. Production

Output  $Y_t$  is produced with private physical capital  $K_t$ , and health capital  $h_t$ . Good health ensures higher productivity. Assuming Cobb–Douglas technology yields

$$Y_t = h_t^\alpha K_t^\beta \quad (1)$$

### 3.2. Health

Health level  $h_t$  depends on total public and total private spending ( $G_t$  and  $S_t$  respectively).  $G_t$  is the sum of public spending on health by own domestic resources  $G_t^G$  and the foreign aid given to the government  $G_t^A$ .  $S_t$  is the sum of household spending on health,  $S_t^h$  and is foreign aid given to the private sector  $S_t^A$ . Assuming also a Cobb–Douglas technology yields health level. We assume here that donors does not spend by themselves but channelize their resources through government or private sector.

$$h_t = B G_t^\mu S_t^\epsilon \quad (2)$$

where  $\mu, \epsilon \in (0,1)$  and measure the relative efficiency of government and private spending on health.

$$\begin{aligned} G_t &= G_t^A + G_t^G \\ S_t &= S_t^A + S_t^h \end{aligned}$$

We assume that health level of the society depends on amount spent on health by government and private sector.

Combining Eqs. (1) and (2)

$$Y_t = B^\alpha G_t^{\alpha\mu} S_t^{\alpha\epsilon} K_t^\beta \quad (3)$$

### 3.3. Households

Each household with disposable income  $(1-\tau)Y_t$  also has a log linear utility function of their consumption and health. They maximize their utility by spending on health and consumption.

$$U_t = \ln C_t + \gamma \ln h_t \quad (4)$$

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