



Childhood preventive care, adult healthcare and economic growth: The role of healthcare financing



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HIGHLIGHTS

- Taxes are higher in full public financing of curative care compared to co-financing.
- In the absence of heterogeneity in health preferences, co-financing dominates (higher growth).
- Heterogeneity decreases public control on the delivering of care.
- It also reduces the efficiency of co-financing.
- Co-financing of healthcare does not always dominate full financing when agents are heterogeneous.

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ABSTRACT

We analyze the impact of healthcare financing on economic growth, focusing on the issue of the joint public–private financing of healthcare (co-payment). We use an overlapping-generations model with endogenous growth based on health human capital accumulation, where families pay for childhood preventive care and the government can either fully finance or co-finance adulthood curative care. From a growth maximizing perspective, distortionary taxes give an advantage to co-financing. Nevertheless, we prove that, if agents are assumed to be heterogeneous in preferences, full financing can become the best option.

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1. Introduction

Since the 1980s, financing of health services has become a critical and urgent issue in many developing countries particularly in Africa, (see Korte et al. (1992)). The aim of this paper is to analyze

the level of public intervention in the financing of healthcare necessary when the objective is to maximize the economic growth rate of countries. Growth rate can be considered as an important target for governments of developing countries thus, when implementing any policy, fiscal or social, it is important to verify if this policy is good for growth, as noted by Gottret and Schieber (2006).

To this end, we develop a simple overlapping-generations (OLG) model where agents live for two periods in a small open economy.³ In the second period however, as parents, they have preferences over current consumption, their own health status, and the level

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³ As we are considering developing countries we do not have a retirement period, given that, on average, people work their entire life. During the first period, agents as children are reared by their parents.

of investment in their children's preventive health. By preventive health we refer, in general, to a set of goods which is much larger than medical goods: feeding, nutrition, hygiene facilities, health education, absence of heavy work activities (domestic child labor), etc. Children generally require little investments in curative care but need a lot of preventive care which in turn determines their health capital when they become adults. We extend the paternalistic model of [Glomm and Ravikumar \(1992\)](#) by incorporating the idea that there is a trade-off between investment in a child's future welfare (preventive) and an adult's health (curative).

Our model can also be compared to models dealing with the question of optimal public spending in endogenous growth framework such as [Barro \(1990\)](#), [Devrajan et al. \(1996\)](#), and such as [Agénor \(2008\)](#) which deals with applications in healthcare policies. As in these papers, our aim is to find the good level of intervention, knowing that taxes are distortive. We differ however from these papers in one aspect: the “public good” (in our case healthcare consumption) is also privately demanded based on the preferences of households. We consider that this assumption is more realistic in the case of the healthcare good compared to the pure public good assumption. Actually as in [Wagstaff \(1986\)](#), people do have a preference for their health status, leading to a direct demand for healthcare (a “health motive”), despite the indirect demand derived for productive purposes.⁴

In our model, the decision of how much to invest in preventive health in childhood and curative health in adulthood is influenced by the weight of both health status and altruism towards children in the parent's preferences. We also open the possibility for heterogeneity in preferences: preventive health and curative health could be valued differently by household decision makers.

The paper is organized as follows. In Section 2 we develop the basic model. Section 3 looks at the two health systems under consideration. In Section 4 we solve for the taxes that maximize economic growth in these two cases and obtain the main results. Section 5 concludes.

2. Basic framework

We consider an overlapping generations economy made up of a continuum of two-period living agents with exogenous population growth, n . Agents reproduce at the beginning of their second period. A single good is produced for consumption in the economy with investments considered to come from abroad. As in [Glomm and Ravikumar \(1992\)](#) and [Preston \(2003\)](#), we do not consider the retirement period and thus all agents born at time $t - 1$ die at the end of time t . Young agents are taken care of by their parents and thus do not make any individual decisions at that age. For tractability, we assume that there are two types of agents with each type having a different level of preference for curative health. The variance in preferences could be due to a number of reasons including location, religion, altruism, etc.

2.1. Household preferences

The economy is populated by N_{t-1} adults at time t with adults differentiated by their preference for curative health, θ_i with $i \in$

$\{1, 2\}$ where θ_1, θ_2 are constant in time.⁵ In the literature this assumption has been justified by the fact that preference parameters are passed on from parent to child in each dynasty. [Cardak \(1999\)](#) and [Preston \(2003\)](#), for example, suggest that ideals and social preferences are often transferred between generations.

For an agent born at time $t - 1$ of type i , in their first period of life preventive care is paid for by parents. In their second period, time t , they possess one unit of labor which they supply inelastically to firms at the market wage rate, ω_t . With this wage they decide on their personal consumption, c_{it} , investment in the preventive health of their children, p_{it} , and their curative health investment, x_{it} . To motivate investments in preventive health capital in childhood, we assume that individuals obtain direct utility from preventive investments in the health of their children. The two generations are therefore linked through the quantity of preventive investments their children receive. In addition individuals also obtain utility from their own curative health investments through its effect on their health capital, h_{it} .

We define the instantaneous utility function of an agent belonging to generation $t - 1$ as

$$U_{it} = \ln c_{it} + \theta_i \ln h_{it} + \pi \ln p_{it} \quad (1)$$

where $\pi \in (0, 1)$ is the altruism factor. We assume here that individuals do not think of their children's preventive health and their own curative health investments as more important than their own consumption. With regard to the ranking of adult curative health and childhood preventive health, we have no empirical evidence to suggest that households rank one higher than the other and thus we give no such restriction.

The household thus faces the program

$$\max_{c_{it}, p_{it}, x_{it}} U_{it} \quad (2)$$

subject to the resource constraint

$$\omega_t = (1 + n) p_{it} + c_{it} + (1 - \lambda) x_{it} \quad (3)$$

where $\lambda \in (0, 1)$ is the co-payment rate. In the case of full financing, when $\lambda = 1$, the decision on x_{it} becomes a full externality. This means that, although the households have preference for curative care, the decision of how much they consume is entirely up to the government. In the paper of [Agénor \(2008\)](#) certainly the closest to our model, preferences of agents are sensitive to health outcomes but, as there is no private market for health services, there is no explicit trade-off between health services and the other consumption goods at the household level.

2.2. Output production

Output, Y_t is produced competitively using physical capital, K_t and aggregate labor capital, H_t , where $H_t = (\rho h_{1t} + (1 - \rho) h_{2t}) N_{t-1}$. We assume that taxes are being placed on production to finance curative health either partially or fully. As underlined in [Tanzi and Lee \(2000\)](#), developing countries are mostly characterized by a large share of agriculture in total output and a large informal sector. Thus wage income represents a small share of total national income. This makes reliance on personal income taxation problematic. It is therefore easier to tax output than to tax wage income. Assuming a Cobb–Douglas production technology yields

$$Y_t = AK_t^\alpha (\rho h_{1t} + (1 - \rho) h_{2t})^{(1-\alpha)} N_{t-1}^{(1-\alpha)} \quad (4)$$

⁴ [Agénor \(2008\)](#) expresses a similar idea in that health is assumed to be desirable as it is in itself pleasant and thus welfare enhancing, in addition to permitting one to engage in several activities such as working to earn a wage. Thus people derive pleasure from being in good health in addition to consuming other goods. [Agénor \(2008\)](#), in studying the optimal allocation of public spending in infrastructure and health, also assumes that individuals are able to provide effective labor only when they are healthy and thus have health influencing growth in addition to affecting the individual's welfare.

⁵ We assume that θ_i is mean preserving with the mean curative preference denoted by $\theta \in (0, 1)$. Thus, $\theta_1 = \theta - \gamma_1$ and $\theta_2 = \theta + \gamma_1 \hat{\rho}$, where ρ agents are of type θ_1 with $\rho \in (0, 1)$, $\hat{\rho} = \frac{\rho}{1-\rho}$ and $\gamma_1 \in \left(0, \frac{1-\theta}{\hat{\rho}}\right)$. The smaller γ_1 is, the similar (or homogeneous) agents become.

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