A new aid modality for Africa

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Abstract

This paper examines the issue of foreign aid and cash transfers to individuals in low-income economies typically found in Africa. Old-age conditional cash transfers and new mobile banking technology can cope with the well-documented problems related to moral hazard and high transaction costs with such policy interactions. Cash transfers can stimulate old and retired individuals' demand for the consumption goods and services, and thereby affect product prices and wages. Developing economies being characterised by underemployment and gross substitution between consumption and leisure, these transfers can stimulate the labour supply and increase capacity utilisation and the production of labour-intensive goods and services, triggering economic growth.

Keywords: mobile banking, foreign aid, economic growth, age-conditional transfers, overlapping generations

1. Introduction

The effectiveness of foreign aid in achieving the objective of economic growth in the least developed countries is questioned (World-Bank 1998; Burnside and Dollar 2000; Alvi and Mukherjee 2008). At the same time a major percentage of aid budgets is being consumed by the development industry and only a minor percentage actually reach out to the target beneficiaries. As a consequence a situation of aid-fatigue in donor countries is evolving, resulting in decreasing aid transfers from OECD countries (OECD, 2008). It is time to rethink current foreign-aid modalities and to search for alternatives. This paper does so by asking the most obvious and simple question, "Can't we just give the money directly to the poor?" An affirmative answer to this question has so far been obstructed by arguments of moral hazard, work disincentives, and high transaction costs (Grosh 1994; Caldes and Maluccio 2004; Schubert and Slater 2006). In addition, we lack theoretical models that show how such support would enhance economic growth.

This paper develops a theoretical model that illustrates how economic growth can be stimulated by a new aid modality consisting of old-age conditional transfers. Targeting all the old people keeps selection costs low, and applying new mobile-phone technology to transferring the funds minimises transactions costs. Additionally, most old people being retired overcomes disincentive problems. Our aim is to stimulate debate by questioning established aid paradigms and demonstrating that potentially more growth-effective and cost-efficient alternatives may be available.

Section 2 of this paper argues the need for a new aid modality and describes how old-age conditional transfers could be a new aid alternative. Section 3 explains the new mobile phone technology and the feasibility of using it to wire money directly to poor people. Section 4 provides related evidence from cash-transfer schemes and international remittances. Section 5 sets up our model. Section 6 presents conclusions.

2. A New Aid Modality

Horror stories of corruption, high overhead costs, swollen donor and multilateral organisations, and of only crumbs reaching the very poorest people are increasingly leading to a feeling of aid-fatigue in donor countries. Only one-fourth of OECD aid is reaching the least developed countries (OECD 2008). In 2007, OECD countries provided US$103.7 billion in aid. In real term foreign aid dropped by 5.1% from 2005 to 2006 and an additional 8.4% from 2006 to 2007 (OECD, 2008). The 2005 Gleneagles G8 summit commitment of raising foreign aid to US$130 billion by 2010 seems unlikely to be reached. Thanks to a considerable increase in debt forgiveness and support to countries like Iraq and Afghanistan, the aid-to-gross national income (GNI) ratio currently fluctuates around 0.3%, which is still better than the all-time low ratio of 0.22% in 1999-2001. This aid ratio is far below the UN target of 0.7%, and also considerably below the ratio in the 1970s, 1980s, and early 1990s when it fluctuated near 0.35% (OECD 2008).

Faced with the aid-fatigue, the donor countries continue with business as usual, which means the inclusion of several stakeholders, the unclear distribution of responsibilities between donors and recipient countries/organizations, and bureaucratic procedures and organisation. As a result only a minor percentage of aid budgets are actually transposed into direct benefits for the target group, which is the poorest people in the least-developed countries. It is problematic how long the necessary public support in donor countries will uphold the current aid regime.

The question of whether foreign aid has a positive effect on economic growth has drawn the attention of many scholars (for an overview see McGillivray, Feeny et al. 2006). One stream of literature claims that aid enhances economic growth because it complements domestic resources and supplements domestic savings, but another argues that it has a

significant negative effect since it is consumed and substitutes for domestic resources (Alvi and Mukherjee 2008).

The most disputed argument is that for aid to have effect supportive local macroeconomic conditions are necessary (World-Bank 1998; Burnside and Dollar 2000). The claim is that in supportive environments aid can do good, while in poor environments it is often ineffective and has a negative effect on economic growth. Aid therefore spurs growth only when sound economic policies are in place prior to its provision.

Several in the research community have come to rescue aid as an effective instrument to trigger economic growth (Hansen and Tarp 2000; Gomanee, Girma et al. 2005; Karras 2006). However, no consensus is reached and still the no-effect-wing holds considerable ground (McGillivray, Feeny et al. 2006). One policy implication is that only approximately one-fourth of OECD aid reaches the least-developed countries, which is where poor environments flourish (OECD 2008).

The aim of this paper is not to take a stand in the growth or not debate. We simply argue that is it time to present alternatives to the current aid modalities. We do so by developing a model that illustrates that with conditional cash transfers to old people economic growth can be triggered also in countries with weak policy regimes. We believe that such alternatives are needed to uphold the general public support for foreign aid in donor countries. Over time taxpayers, who are also voters, may not allow that three quarters of foreign aid goes to others than those they want to support, the poorest.

Not counting emergency aid, the aim of most foreign development aid is to stimulate economic growth by strengthening the supply side of national economies. It improves educational systems, builds roads, adopts legal frameworks, makes financial services available, and installs production facilities, supposedly driving economic growth by increasing and improving supply. However, many have started to question this

conventional view and have advocated demand-led growth as a development strategy (Barbosa-Filho 2004; Madrick 2007).

The recent emergence of cash-transfer programmes can be considered a practical response to the need for demand-led growth strategies. Supporters argue that cash transfers directly to poor people do not have to be counterproductive and do not necessarily carry an inflationary risk (Farrington and Slater 2006). However, the primary argument behind most cash transfer programmes is principally that they provide social protection for such extremely poor groups as children, in the form of schooling, and ex-soldiers, through cash for work. Few, if any, internationally funded cash transfer programmes have been designed with the simple objective of just spurring an economy's overall economic growth. The conditionality present in most cash transfer programmes makes them bureaucratic, ineffective, and inefficient. Their main concerns are to install selection mechanisms to reach only the poorest of the poor, to justify their expenditures for public budgets, and to avoid moral hazard (Farrington and Slater 2006; Schubert and Slater 2006). Moral hazard refers to situations in which beneficiaries decrease their personal efforts to improve their economic situations as a result of outside support.

This paper's main concern is not social protection. We suggest cash transfers to old people simply because their working capacity is limited. This reduces disincentives to work and thus the risk of moral hazard. Moreover, we advocate providing the transfer to all old people, not because they often are among the poorest, but because it is an objective criterion which ensures cost-efficient operations. Another of our selection criteria is poor countries with a need for economic growth, but without an enabling environment to spur it. Our concern is therefore to outline a new, cost-efficient modality for foreign aid to enhance economic growth in the least developed countries. We will therefore in section five outline an economic model to support our idea.

3. A New, Emerging Technology

The original motivation for this paper was actually not the growth-aid debate, but the observation of the explosive development and outreach of mobile phone technologies and coverage (Batchelor 2008). This led us to ask whether this technology could be used to channel foreign aid directly to those whom OECD taxpayers want to support. Achieving this objective has previously been thwarted not only by arguments of moral hazard, but also by the observation that the transfer of money directly to poor people has so far been difficult and costly. In many developing countries nine out of 10 people do not have a bank account or access to basic financial services (UN 2006), and the cost of conventional banking is high (Batchelor 2008). Large scale cash transfers to individuals have therefore so far been both difficult and costly.

This situation is now changing with the convergence of telecommunication and financial services. Money transfers through mobile phones directly to individuals, whether they live in rural or urban areas, are about to become logistically feasible at low cost even in the poorest countries. In most African countries most people already have access to a mobile phone with coverage in their neighbourhoods. The total number of African mobile phone subscribers are now way beyond 300 million (International Telecommunication Union (www.itu.int).

This rapid technological development, together with the steep increase in mobile-phone coverage, opens up an enormous set of new opportunities. Adding an additional 10 mobile phones per 100 people would boost a typical developing country's GDP by 0.6% (Waverman, Meschi et al. 2005). Banks have already started to make use of the mobile phone infrastructure and are developing systems to wire monies to SIM cards. For example, in Kenya, Vodaphone reached 1 million users in only nine months with a product called M-

Pesa (Batchelor 2008). Vodaphone has now announced a partnership with Citigroup to enable international transfer products using mobile phones as a platform.

In the Philippines the two largest mobile-phone operators, SMART Communications and Globe Telecoms, have already launched mobile banking solutions aimed at poor people. By March 2006 Globe Telecoms had approximately 1.3 million registered users for its G-Cash payments system, which allows customers to use their mobile phones to make such financial transactions as repaying loans, transferring money to friends and relatives internationally, and paying for goods and services. SMART Money offers many of the same features as G-Cash, and its most popular feature, SMART Padala, which means *send*, enables over 1 million Filipino overseas workers to transfer almost US$50 million per month to their relatives in the Philippines (Batchelor 2008).

These examples illustrate how people have access to mobile phones even in poor countries. The technology to enable the use of mobile phones to allow cost-efficient money transfer to individuals in developing countries is being put into place. For the first time in history it is now feasible to give money to poor people without encountering high transaction costs. No banks are needed. One can now sit in London and transfer money to a person in the village of Katorongot in Kenya. The technology is already there and is increasingly being rolled out. The idea of transferring foreign aid as cash directly to individuals is therefore now feasible.

4. Related Evidence

In a pilot project in Zambia, a cash-transfer programme covering the poorest 10% of the households in 143 villages and five townships was established on the premise that additional purchasing power would create multiplier effects for the local economy (Schubert and Goldberg 2004; Schubert and Slater 2006). As a December 2004 evaluation confirmed, the purchase of food, soap, blankets, and agricultural inputs stimulated the local

economy. New forms of labour exchanges emerged as destitute, labour-constrained households used their cash to pay for labour to plough and weed fields. The evaluation also concluded that the transfer of cash had not had an inflationary effect on input prices or distorted the local labour markets (Schubert and Goldberg 2004).

The Zambian example is one among several in which cash distribution has recently been used as an alternative to other, often more problematic, aid techniques. However, the Zambian case is also interesting from the perspective of mobile-phone technology. According to the evaluation, a major problem for the project was to reach out to remote rural areas in a cost-efficient manner (Schubert and Goldberg 2004). This is in line with a common criticism of cash-transfer programmes, which is that administration costs absorb much of their budgets, which never reach the intended beneficiaries (Grosh 1994; Caldes and Maluccio 2004).

Capital inflow from remittances is a parallel to foreign aid. A major difference is that remittances go directly to the end-beneficiaries, similar to what we propose to do with foreign aid. If transfers of foreign aid directly to poor people have a positive impact on economic growth, therefore so should the inflow of remittances. However, empirical studies of this show mixed results. Giuliano and Ruiz-Arranz (2005) found that remittances do enhance economic growth, including in less financially developed countries, but Chami *et al*. (2003) found them to have a negative effect on economic growth. The Chami *et al*. study is of particular importance for this paper, since their argument is that remittances' negative effect on economic growth stems from moral hazard problems. With an inflow of money from others, the recipients can decrease the effort they exert in labour, creating a disincentive to work. Targeting those who no longer work, that is the old, can minimize the risk of moral hazard.

5. The Model

To illustrate how a conditional nominal transfer affects economic growth, we applied an overlapping generations model without physical capital. Excluding capital markets impedes persistent growth but maintains temporary growth effects and long-run level effects. The rationale for this simplification stems from the structure of the markets we are considering.

Since the transfers are conditional on a certain age level and therefore primarily affect the demand of old people, it is reasonable to account for their purchasing patterns. Old people mainly consume such goods as food, health-care services, and, if they have the opportunity, schooling services for their grandchildren. These goods are all characterised by being highly labour-intensive and to some degree non-tradable. The production of these services in poor countries is therefore mainly based on labour. First-order effects on production due to stimulated demand accordingly trigger production activities driven by labour. Second-order and multiplier effects that produce higher incomes for workers also increase the demand for capital-intensive goods, and therefore induce a need for physical capital. The following model, however, does not account for such a multiplier effect.

A central feature of poor developing countries is that labour is underutilised, through both unemployment and underemployment. In relation to our transfer proposal and first-order effects on production, we are primarily concerned with underemployment. Addressing underemployment requires that workers have an alternative to market activities and that they base their labour-supply decision on alternative cost considerations. Stimulating labour supply can therefore result in an increase in production.

The low utilisation of labour capacity is an incentive problem due to the low wages paid for work activities. Low wage levels reflect situations in which the prices of goods and services are low enough to allow workers to allocate their time to home activities instead.

Home activities create an alternative to market activities, and when people regard producing for personal or household consumption as having a higher return than producing for the market, working individuals prefer the former. These considerations assume that labour is idle and not fully utilised in market activities, so that motivating the labour force to increase its labour supply for the market is likely to stimulate economic growth. This mechanism requires that labour supply is elastic, and therefore endogenous.

One way to increase the opportunity cost of working for personal or household consumption is to stimulate demand and thereby increase the prices of both final goods and wages. To initiate such changes we propose to increase the purchasing power of old people. By subsidising the consumption of old people we avoid the moral hazard problems described above. As altruism toward descendents and bequests are excluded from the model by assumption, higher purchasing power is likely to increase demand. Standard economic theory illustrates how an increase in demand increases prices as long as the supply of a good is an increasing function of price. Higher prices on final goods or services increase the wages of the working part of the population. If leisure and consumption are considered to be substitutes, higher wages are likely to stimulate the labour supply, and thereby growth-promoting activities, provided that the labour supply is elastic.

5.1 Individual Behaviour and Endogenous Labour Supply

Let us consider an overlapping-generations economy in which each generation consists of a continuum of individuals assumed to maximise lifetime utility. Each individual lives through two periods. In their first period they elastically supply a portion $\hat{l}_t \in (0, \bar{l}_t)$ of labour, where $\bar{l}_t$ is total time available. Accordingly, individual leisure time is $l_t = \bar{l}_t - \hat{l}_t$. This implies the expression for capacity utilisation $CU = \hat{l}/\bar{l} < 1$.

In the second period of their lives, individuals are non-working and consume out of their own savings. For simplicity, we restrict our model by assuming that an individual born in period t endogenously supplies labour during period t and consumes only in period $t+1$ (Reichlin 1986; Duranton 2001). For analytical purposes we assume a constant intertemporal elasticity of substitution (CIES) description of people's preference structure. Disutility of work and only old-age consumption implies the following utility function:

$$(1) \qquad u_t = u(l_t, c_{t+1}) = \left(l_t^{\frac{\sigma-1}{\sigma}} + c_{t+1}^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{\sigma-1}},$$

where c denotes consumption and $\sigma \neq 1$ is the elasticity of substitution. The value of σ is crucial for the relation between leisure in period t and consumption in period $t+1$. As we are considering growth-promoting strategies in poor, low-income countries, it is reasonable to assume that leisure and consumption are gross substitutes, i.e. $\sigma > 1$ (Duranton 2001).

Let us first consider individual labour supply responses without transfers. As the agent saves all income when young, we can derive the intertemporal budget constraint as:

$$(2) \qquad P_{t+1} c_{t+1} = w_t \left(\bar{l}_t - l_t \right),$$

where P_{t+1} is the price of goods bought in period $t+1$, w_t is the wage rate, and the right-hand side therefore shows individual savings when young. In period t the agent only has expectations about prices. However, in equilibrium it is assumed that the consumers have perfect foresight. Maximisation of the utility function in (1) subject to the constraint in (2), with respect to l_t and c_{t+1}, yields a dynamic optimisation problem. Setting the Lagrangean for this problem we obtain:

$$(3) \qquad \Gamma(l_t, c_{t+1}, \lambda) = \left(l_t^{\frac{\sigma-1}{\sigma}} + c_{t+1}^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{\sigma-1}} - \lambda \left[P_{t+1} c_{t+1} + w_t l_t - w_t \bar{l}_t \right].$$

The first order conditions of this problem imply that optimal demand for leisure and consumption is shown by:

(4)
$$l_t = \frac{\bar{l}_t}{1 + w_t^{\sigma-1} P_{t+1}^{1-\sigma}},$$

(5)
$$c_{t+1} = \frac{w_t \bar{l}_t}{P_{t+1} + w_t^{1-\sigma} P_{t+1}^{\sigma}}.$$

Partial equilibrium analysis of the relation between the wage rate and leisure shows that:

(6)
$$\frac{\partial l_t}{\partial w_t} = -(\sigma - 1)\frac{\bar{l}_t P_{t+1}^{1-\sigma} w_t^{\sigma-2}}{\left(1 + w_t^{\sigma-1} P_{t+1}^{1-\sigma}\right)^2} < 0,$$

if and only if $\sigma > 1$. This relationship illustrates that an increase in the wage rate in the market reduces the demand for leisure and thereby increases the labour supply. If a transfer stimulates the demand for services and thereby prices and wages, workers will be motivated to increase their supply in the market and capacity utilisation increases.[1]

Let us now illustrate the inclusion of a conditional transfer to old people. This can be done by considering the transfer as a subsidy on consumption as long as the increase in purchasing power leads to higher demand and nothing is saved. Such a quantity subsidy, $s > 0$, augments the budget restriction (Eq. 2) to:

(7)
$$(P_{t+1} - s)c_{t+1} = w_t(\bar{l}_t - l_t).$$

Each individual's dynamic optimisation problem is then to maximise Eq. (1) in respect to Eq. (7). Optimal demand for leisure and consumption goods is, accordingly:

(8)
$$l_t = \frac{\bar{l}_t}{1 + w_t^{\sigma-1}(P_{t+1} - s)^{1-\sigma}},$$

(9)
$$c_{t+1} = \frac{w_t \bar{l}_t}{P_{t+1} - s + w_t^{1-\sigma}(P_{t+1} - s)^{\sigma}}.$$

To show how individual labour supply reacts to a quantity subsidy, we differentiate Eq. (8) in respect to s. This gives us the following relationship:

(10)
$$\frac{\partial l_t}{\partial s} = \frac{\bar{l}_t(1 - \sigma)(P_{t+1} - s)^{-\sigma}}{w_t^{1-\sigma}\left(1 + w_t^{\sigma-1}(P_{t+1} - s)^{1-\sigma}\right)^2}.$$

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[1] The same relationship holds for a general equilibrium analysis.

The sign on this derivative depends on the relationship between the price on the consumption good and the subsidy. We assume here that the transfer to old people's consumption is less than the price of the good. It is unreasonable to subsidise a good more than it costs, or $P_{t+1} > s$. The latter assumption, along with the assumption of gross substitution, implies that $\partial l_t / \partial s < 0$. Accordingly, the introduction of a subsidy reduces the demand for leisure, stimulates the labour supply in the market, and therefore leads to an increase in capacity utilisation.

5.2 Production

There is only one good in this economy. As old people in poor countries mainly buy services, and since capital is relatively scarce, we can assume that the production of the good is labour intensive. For simplicity, we assume that labour (L_t) is the only input factor. Accordingly, the production technology is shown by:

(11) $$Y_t = F(L_t) = AL_t^{\alpha},$$

where $A > 0$ and $\alpha \in (0,1)$, denoting a technical scale parameter and the labour share, respectively. The restricted value on the labour share implies that the production function has positive and decreasing marginal productivity. This feature impedes perpetual economic growth through long-run level effects on production, and transitional growth effects are therefore possible. Given the wage rate and the product price, producers choose the level of labour to maximise profits, $\pi_t = P_t AL_t^{\alpha} - w_t L_t$. The economy is assumed to be perfectly competitive, and the first-order condition of a representative producer is shown by:

(12) $$\alpha P_t AL_t^{\alpha-1} = w_t,$$

where the left hand side is the marginal revenue. The factor demand function is therefore:

(13)
$$L_t = \left[\frac{w_t}{\alpha A P_t} \right]^{\frac{1}{\alpha - 1}}.$$

5.3 Equilibrium and Analysis

The present model economy has two markets. The final-goods market and the labour market. In the labour market, during each period t, N_t children are born, so at each period $t \geq 1$, $N_t + N_{t-1}$ individuals are alive. The population grows at a constant rate of $n > -1$. therefore, $N_{t+1} = (1 + n)N_t$. The labour market equilibrium condition is derived by equalising the producer's labour demand (Eq. 13) and the total labour supply:

(14)
$$L_t = \hat{l}_t N_t.$$

If $\hat{l}_t = \bar{l}_t$, then $l_t = 0$, and the agents devote all their time to working activities in the market. Leisure and the possibility for home production are then zero. However, assuming that $CU < 1$, which implies that capacity utilisation is not full, labour is therefore idle for market activities, or $0 < l_t < \bar{l}_t$.

According to Walras's law, in period t equilibrium in the labour market implies that of the final-product, or service, market:

(15)
$$Y_t = A\left(\hat{l}_t N_t\right)^\alpha = c_t N_{t-1},$$

where the right hand side denotes consumption by old people in period t.

As mentioned earlier, age-conditional transfers to a selected segment of the population are likely to trigger demand for final goods and to increase prices and wages. To evaluate how this policy interaction affects the economy's growth level we must consider the effect of the subsidy on the production level. By inserting the optimal demand for leisure (8) and the first-order condition in (12) into the production function in (15), the supply function becomes:

$$(16) \qquad Y_t = AN_t^{\alpha} \left[\bar{l}_t - \frac{\bar{l}_t}{1 + \left(\alpha A P_t L_t^{\alpha-1}\right)\left(P_{t+1} - s\right)^{1-\sigma}} \right]^{\alpha}.$$

Differentiating Eq. (16) in respect to the subsidy yields the following:

$$(17) \qquad \frac{\partial Y_t}{\partial s} = \underbrace{-\alpha AN_t^{\alpha}}_{(1)} \underbrace{\frac{\bar{l}_t \left(\alpha A P_t L_t^{\alpha-1}\right)^{\sigma-1}\left(1-\sigma\right)\left(P_{t+1}-s\right)^{-\sigma}}{\left[1 + \left(\alpha A P_t L_t^{\alpha-1}\right)^{\sigma-1}\left(P_{t+1}-s\right)^{1-\sigma}\right]^2}}_{(2)}$$

$$\times \underbrace{\left[\bar{l}_t - \frac{\bar{l}_t}{1 + \left(\alpha A P_t L_t^{\alpha-1}\right)^{\sigma-1}\left(P_{t+1}-s\right)^{1-\sigma}} \right]^{\alpha-1}}_{(3)} > 0.$$

The inequality follows as (1) < 0, (2) < 0, and (3) > 0. (1) < 0 follows immediately. (2) < 0 follows, as the numerator is negative due to $P_{t+1} > s$, and $\sigma > 1$. (3) > 0 follows as the denominator in the second term is greater than unity due to $P_{t+1} > s$.

The result in Eq. (17) can be intuitively explained as follows. The implementation of a transfer that subsidises the consumption of retired people increases their demand in the market. An increase in demand for a final product or service increases its price as long as its supply is an increasing function of the price, or as long as the supply curve is increasing. This relationship follows as the economy operates beneath the production-possibility frontier. Higher demand and prices increase wages.

Underemployed workers in the market comprise underutilised capacity and therefore lower than optimal production. Idle workers are usually considered to be inefficiencies in the economy. However, this may not be the case here, as the workers may find it individually optimal to allocate their time to home-production activities rather than to activities in the market. The current model, however, assumes this behaviour to be influenced by changes in demand and wages. As the subsidy leads to higher wages, workers become stimulated to devote more time in the market and the labour supply therefore increases due to the assumption of gross substitution. The effect on the labour

supply is already shown to be in partial equilibrium, however. The same relationship holds in general equilibrium. As the production is due to labour only, the production level is likely to increase.

The first-order effects illustrated here do not imply an increase in persistent growth, but only short-term growth effects or growth in a transitional phase. This is due to the simplicity of the production structure and labour being assumed to have diminishing marginal productivity. This assumption is natural, as capital eventually will be necessarily in most production activities. However, second-order or multiplier effects should be observable, as the increase in production should increase the workers' income and consequently stimulate their demand for final goods and, most likely, for input factors. The working individuals' demand for input factors and their consumption pattern are most likely different from the old people's, and will consequently stimulate production in other sectors in the economy. In such a setting it will be necessary to include capital markets.

6. Conclusion and Proposals for Further Research

This paper aims on stimulating debate by introducing a new modality for foreign aid. With the help of an economic model, we demonstrate how direct cash transfers to old people can spur economic growth. Targeting all old people minimises selection costs. That most old people are retired and not in the labour market helps to overcome moral-hazard problems. The original motivation for the paper came from the rapid spread of mobile phones across Africa, which now makes direct cash transfers at a low cost feasible. Compared to the traditional foreign-aid regime through which often only crumbs reach the end beneficiaries, our proposed model can assure that nearly 100% of the money actually reaches Africans, most of them extremely poor, living in the least-developed countries. Moreover, our model illustrates that such transfers will trigger economic growth.

From an empirical point of view, the next step is naturally to design and implement some geographically limited pilot schemes to try out the idea. One challenge will be public registries to verify peoples' ages, but this problem is gradually becoming manageable as national registers of residents in many countries have improved considerably during the last decade. Another challenge is related to annual renewals, which are needed to verify that the beneficiary is actually still alive. These are challenges where local adaptations will be needed.

As for the applied model itself, one natural extension is to include the capital market. This would advance the production function and yield an opportunity to study long-run growth effects via capital accumulation. Moreover, interest rates would be a part of the model and affect individual budget constraints. The consumption of both final goods and leisure would therefore depend on the interest rate. A complicated feature with overlapping-generation models with productive capital, augmented to include endogenous labour supply, is related to stability and indeterminacy. The existence of multiple equilibrium paths may, however, be dealt with by imposing appropriate restrictions (Mendes and Mendes 2005; Nourry and Venditti 2006).

Another extension of the model would be to include consumption in each individual's first period of life. Such an extension would change both the utility function and the budget constraint. Instead of saving all the income earned in the first period of life, individuals would then adjust to derive an optimal saving rate. This would affect both consumption and economic growth.

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