The extension of social security coverage in developing countries

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ABSTRACT

We study the dynamic general equilibrium effects of introducing a social pension program to elderly informal sector workers in developing countries who lack formal risk sharing mechanisms against income and longevity risks. To this end, we formulate a stochastic dynamic general equilibrium model that incorporates defining features of developing countries: a large informal sector, private transfers as an informal safety net, and a non-universal social security system. We find that the extension of retirement benefits to informal sector workers results in efficiency losses due to adverse effects on capital accumulation and the allocation of resources across formal and informal sectors. Despite these losses recipients of social pensions experience welfare gains as the positive insurance effects attributed to the extension of a social insurance system dominate. The welfare gains crucially depend on the skill distribution, private intra-family transfers and the specific tax used to finance the expansion.

1. Introduction

Individuals in developing countries are confronted with a shortage of risk-sharing mechanisms which prevents them from being able to effectively insure their income and longevity risks. Private financial markets are underdeveloped and do not provide viable insurance instruments for large parts of the population. Public social insurance systems, on the other hand, cover only a small fraction of the population working in the formal sector. According to Palacious and Pallares-Mirallets (2000) the coverage rates of social security systems are usually less than 10% in low income countries and rarely exceed 50% in middle income countries. Therefore the traditional family support system – briefly summarized as parents supporting their young children and becoming recipients of support from their children when old – appears to be the most important source of income for the elderly, especially elderly informal sector workers (e.g. Cox et al., 2006; Jung and Tran, 2008; World-Bank, 1994). However, the family transfer system cannot pool risk well across families

so that an argument for increased government intervention can be made (compare Chetty and Looney, 2006; ILO, 2002; Palacious and Sluchynsky, 2006; Summers, 1989). A number of developing countries including Brazil, South Africa, India, and China have recently started government transfer or social pension programs for the uncovered elderly.[1]

In this paper we conduct a quantitative analysis of the general equilibrium effects of extending social security coverage to workers in the informal sector in the context of developing countries. We formulate a two-sector, dynamic general equilibrium, dynastic overlapping generations model with incomplete markets and heterogeneous agents that incorporate important features of developing countries. First, we model the existence of an informal production sector using the approach in De Soto (1989). Second, we model the presence of an informal safety net working through inter-generational private transfers. We follow the approach in Laitner (1992) and Fuster (1999) and assume that agents are two-sided altruistic, so that parents and children pool their resources and decide on transfers between households within a dynasty. Third, we capture the basic

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[1] Palacious and Sluchynsky (2006) use the term social pension for such transfers.

structure of social security systems in developing countries and introduce a non-universal and relatively small pension program for formal sector workers only. We then calibrate the model to match key characteristics of the Brazilian economy, a middle-income developing country that introduced a large-scale social pension program in early 1990. This initial calibration constitutes our benchmark economy. Finally, we introduce a social pension program for informal sector workers financed by either a consumption, labor or capital tax into the benchmark economy.

The extension of the social pension program to informal sector workers has two roles. First, it is an intergenerational redistribution mechanism that transfers income to the poor elderly in the informal sector. Second, it is an important source of insurance against income and longevity risks, which allows households to smooth their consumption over the life cycle and over time. It subsequently provides avenues for more efficient risk sharing across households and generations, which potentially decreases inequality and improves welfare (i.e. *positive insurance effects*). On the other hand, as social pensions become a non-trivial source of income, they will crowd out the traditional family insurance system and create distortions in goods and labor markets that decrease aggregate output (i.e. *negative efficiency effects*).

In our model we find that a social pension program with a 50% replacement rate of average active wages decreases aggregate physical capital by up to 4% and human capital by up to 2.5%. In addition, some physical and human capital is shifted into the less productive informal sector. As a result, output decreases by 4%. Moreover, we compare the ex ante expected utility in the model with a social pension with the ex ante expected utility without a social pension and find that recipients of social pensions experience welfare gains.

The driving mechanism behind this positive welfare result is the trade-off between positive insurance effects and negative efficiency effects. In our model private insurance markets are absent and informal safety nets (i.e. intergenerational family transfers) are used for insurance. However, informal safety nets fail to provide a complete mechanism to transfer resources across different income groups and generations. A social pension program is a public inter-generational transfer mechanism that provides an important alternative that is able to not only re-distribute income across households within a dynasty but also across different dynasties. In this sense, the modeled social pension program, targeted to the elderly in the informal sector, provides social insurance against both income and longevity risks for this low income group. Moreover, segmentations in labor markets and production sectors expose informal sector workers (that is poor and low ability types) to even more risk. In this context, the insurance role of the social pension program tends to become even more pronounced.

On the other hand, the social pension program creates adverse incentives for precautionary savings and the various decisions associated with the labor market. This can lead to crowding-out effects (i.e. social insurance instead of intra family transfers) and allocative distortions (i.e. early retirement, changes in sector choices, etc.). The former primarily leads to decreases in capital accumulation and aggregate labor supply, while the latter distorts the allocation of physical and human capital toward the low productivity (informal) sector. However, since the social pension program targets only the relatively small group of older informal sector workers, the adverse effects tend to be small. In addition, intended bequests through family networks mitigate some of the crowding-out effects. Overall, we find that in an environment that lacks formal risk-sharing mechanisms, welfare gains due to insurance and redistribution effects dominate welfare losses from distortions and crowding out effects.

We provide a series of incremental experiments where we analyze the contribution of the various features of the model toward generating the observed welfare gains for recipient households. It turns out that skill heterogeneity and intentional bequests are two of the most important features that contribute to the welfare gains for recipient households. Other features like endogenous sector choice, technology differences between formal and informal sectors, or general equilibrium effects do change our results quantitatively but not qualitatively.

Finally, we analyze the important question of how to finance this reform. We use three separate tax regimes: a consumption tax, a labor tax on formal sector workers only, and a capital income tax. The economic distortions and the degree of social insurance provided through the tax–transfer system as a whole depend on the progressiveness of the tax in use. When a labor tax is used to finance the expansion, the positive insurance and redistribution effects of the social pension program outweigh the negative crowding-out and resource allocation effects. This creates welfare gains for recipient households. However, this is not generally true when a capital tax finances the expansion. In this case the distortions become very large and most recipient households also experience welfare losses.

Our work is related to several branches of the social security literature. First, the studies evaluating the effects of public policy in developing countries have mainly focused on empirical microeconomic analysis using partial equilibrium models (e.g. see Cox and Jimenez, 1992, 1995; Edwards and Cox-Edwards, 2000; Gruber, 1995; Jensen, 2003; Jung and Tran, 2008; Packard, 2002; Rofman and Carranza, 2005; Schmidt-Hebbel, 1999; Valdes-Prieto, 2008). This approach abstracts from dynamic general equilibrium aspects which our current study provides.

More recently, Acemoglu (2010) argues that general equilibrium and political economy aspects are important for the external validity of econometric estimates. Papers advancing general equilibrium analysis of public policy in developing countries include Corsetti (1994), Loayza (1996), Fortin et al. (1997), Schmidt-Hebbel (1997), and Levy (2008). We contribute to this literature by focusing on the redistributional effects created by social pension systems in multi sector economies. To our knowledge, the literature on general equilibrium effects of social pensions in developing countries is sparse and none of the studies mentioned above has focused on exploring the insurance and redistributional effects of social pensions simultaneously in a qualitative and quantitative way.

The body of literature analyzing the effects of social security systems in developed countries is very large. Since the seminal contribution by Diamond (1965) the adverse effects of unfunded social security have been well documented in general equilibrium life cycle models (e.g. see Auerbach and Kotlikoff, 1987; Hubbard and Judd, 1987; Imrohoroglu et al., 1995b).[2] This literature emphasizes the importance of accounting for general equilibrium effects and concludes that the expansion of social security systems usually leads to welfare losses because the adverse effects on capital accumulation and labor supply tend to dominate the positive insurance effects. We extend this approach by incorporating some of the defining features of developing countries and find that in contrast to previous studies calibrated to developed countries, welfare gains for the recipients of social pension benefits can be realized. These results depend on crucial features in the model: (*i*) skill heterogeneity coupled with segmented formal and informal labor markets and production sectors is essential to generate the degree of wealth disparity that amplifies the positive insurance effects of the reform; (*ii*) the social pension system in developing countries we are considering targets only the informal sector retirees, i.e. 50% rather than 100% of the retirement age population. This feature, compared to a universal pay-as-you-go pension system, keeps the program relatively small so that the distortions that it triggers are not too severe; and (*iii*) bequest motives alleviate

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[2] For an excellent literature survey of the literature on unfunded social security see Imrohoroglu et al. (1999).