Pay-as-you-go financed public pensions in a model of endogenous growth and fertility

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Abstract. Employing an overlapping generations endogenous growth model in which parents derive utility from having children and, additionally, expect children to support them in old age, this paper explores the interrelation between growth, fertility, and the size of pay-as-you-go financed public pensions. It is shown that small sized public pensions stimulate per capita income growth, but further increases in public pensions eventually reduce it. Fertility, on the other hand, falls by an increase in public pensions if they are either small or large. Medium sized public pensions, however, may stimulate fertility.

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1. Introduction

Endogenous per capita income growth models generally imply a negative relationship between pay-as-you-go financed (PAYG-) public pensions (or public debt) and per capita income growth. The mechanism underlying this result is that intergenerational redistribution from young to old individuals discourages private saving and reduces capital accumulation. In endogenous growth models this effect translates to reduced per capita income.

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growth [see, e.g., Jones and Manuelli (1992), Saint-Paul (1992), Grossman and Yanagawa (1993), and King and Ferguson (1993)]. Since the capital market is the only device in these models to secure old-age consumption privately, introducing PAYG-public pensions exerts crowding out effects solely on capital market activities. There is, however, another institution which has traditionally served as a means of old-age insurance: the family. Voluntary intrafamily transfers from young to old individuals, either in cash or in kind, have been observed in virtually all societies, and they have substantially contributed to the livelihood of the old [see, e.g., Hansson and Stuart (1989) and Ehrlich and Lui (1991)]. These intrafamily transfers provide an individual rationale to settle down a family and to meet the cost of rearing children in order to secure old-age consumption. PAYG-public pensions, however, diminish the importance of children as an insurance good and, henceforth, lower individual demand for children [see, e.g., Bental (1989), Raut (1992), Cigno (1993), and Zhang and Nishimura (1993)]. Recently, Junsen Zhang and Junxi Zhang (1995) and Junxi Zhang (1995) studied the impact of PAYG-public pensions on per capita income growth and fertility considering both private alternatives to insure old-age consumption needs. They showed that if the demand for children is due to an insurance motive, introducing unfunded PAYG-public pensions leads to a decrease in fertility but an increase in per capita income growth. The fertility reducing effect of a public pension system thus offsets the saving reducing effect and stimulates growth of per capita income.

The present paper extends this approach by considering that people generally not only have children because they expect their children to support them in old age, but also because they regard their children as desirable in themselves. Children not only fulfill insurance needs but serve also as a consumption good. Emphasizing both the insurance and the consumption aspect of children, allows to capture some material aspects of the interrelation between PAYG-public pensions, fertility, and growth which have been neglected so far. First, if parents display a mixed motivation for having children, viewing them both as an insurance and a consumption good, introducing an additional old-age insurance opportunity does not necessarily reduce, but may even stimulate the demand for children [see, e.g., Nerlove, Razin, and Sadka (1987)]. As a consequence, the mutual dependencies between growth and fertility and the effects evoked by an increase in public pensions take a different shape when the consumption aspect of children is considered. Second, public pensions tend to crowd out private intergenerational transfers from the young to the old and render children as an insurance good rather useless. Given that individual pensions are independent of individual fertility, which is a common feature of most real world public pension schemes, the motive for having children disappears if they are solely viewed as an insurance good. In such a context, only those public pension schemes can be studied which coexist with private intergenerational transfers, because otherwise no reproductive activities would take place. Viewing children both as an insurance and a consumption good remedies this deficiency and allows to consistently study the effects of public pensions which coexist with as well as those which completely crowd out private intergenerational transfers within a single framework. In this way, the present approach permits to study the impact of a variety of different