

# Capital–skill complementarity and the redistributive effects of Social Security Reform <sup>☆</sup>

Alessandra Casarico <sup>a,b,c,\*</sup>, Carlo Devillanova <sup>a</sup>

<sup>a</sup> *Università Bocconi, Milano, Italy*

<sup>b</sup> *CEPR, London, UK*

<sup>c</sup> *CESifo, Munich, Germany*

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## Abstract

This paper analyses the general equilibrium implications of reforming pay-as-you-go pension systems in an economy with heterogeneous agents, human capital investment and capital–skill complementarity. It shows that increasing funding, by raising savings, delivers in the long run higher physical and human capital and therefore higher output, but also higher across-group wage and income inequality. It also shows that the general equilibrium effects induced by this reform affect groups' sizes in a way that the higher across-group inequality generated by more funding goes with a larger share of the population against redistribution.

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## 1. Introduction

The discussion over the problems of traditional pay-as-you-go pension systems and on how to change them is by now a long standing one.

A considerable amount of conceptual and empirical work has been directed to identify alternative reform proposals and their impact on different economic variables.<sup>1</sup> Whatever the specific institutional features of these alternative proposals, most of them include some degree of funding. The claimed advantages of introducing or increasing funding with respect to parametric reforms which would maintain the pay-as-you-go nature of traditional social security

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\* Corresponding author. Istituto di Economia Politica, Università Bocconi, via Gobbi 5, 20136 Milano, Italy. Tel.: +39 02 58365325; fax: +39 02 58365318.

E-mail address: [alessandra.casarico@uni-bocconi.it](mailto:alessandra.casarico@uni-bocconi.it) (A. Casarico).

<sup>1</sup> See for instance Diamond (1998, 2002) and Sass and Triest (1997).

systems range from higher returns and higher savings to fewer labour market distortions and lower political pressure (see for instance Feldstein, 1998, 2005). Given the general attractiveness of funding, the main concerns stem from transitional, risk and redistributive issues and from the political feasibility of such a change.<sup>2</sup>

Although, according to Gruber and Wise (2002), income redistribution is among the four economic goals which a reform should pursue – the others being to correct the financial imbalance, to increase national saving and to strengthen economic efficiency – the economic literature on pension reform deals only marginally with *intragenerational* redistribution. Namely, when considering redistributive issues, it focuses almost exclusively on the *intergenerational* redistribution generated by an increase in funding either during the transition period or in the long run.<sup>3</sup> Redistribution within generations is sometimes taken into account by models considering the transition to a fully funded system (see for instance Brunner, 1996 and Feldstein and Liebman, 2002) but it is seldom a long run issue. The absence of an explicit theoretical analysis of the long run intragenerational redistributive implications of introducing more funding<sup>4</sup> is even more critical if one takes into account that, starting from the World Bank (1994) proposal of a three-pillar social security system, the funded component is almost always accompanied by a public, mandatory, pay-as-you-go pillar which should take care of redistributive concerns either via benefit floors, or minimum income guarantees, or flat universal benefits.

This paper tries to fill the gap by analysing the general equilibrium implications of introducing some funding in an economy where there is a pay-as-you-go partially redistributive pension system. It focuses on the intragenerational conflicts that this reform generates both in the short and in the long run. It then studies whether these conflicts can be tackled by changing the degree of intragenerational redistribution performed by the smaller remaining pay-as-you-go pension scheme. The analysis sheds some light on the compatibility between (private) funding and (public) redistribution which is taken for granted by the current policy debate.

We model a two-period OLG closed economy characterised by agents' heterogeneity, human capital investment and capital–skill complementarity. The literature on pension reform commonly assumes that workers are perfect substitutes once productivity differentials are adjusted. Under this assumption, an increase in funding by raising savings and the capital stock, delivers higher real wages for all in the new steady state, leaving relative wages unchanged. The assumption of capital–skill complementarity implies that policy variables affecting physical capital influence across-group wage inequality: namely, changes in the size of the pay-as-you-go system, by modifying capital, also change across-group inequality bringing about new issues in the analysis of pension system reforms. The inclusion of an education decision responds to the need of integrating the analysis of the long run implications of pension reform on physical capital to those on human capital and it offers an endogenous mechanism to offset changes in across-group inequality.

We find that a social security reform based on an increase in funding delivers a higher steady state level of physical and human capital but also a higher across-group wage and income inequality. This is new to the literature on social security reform: with capital–skill complementarity not only pension gaps between the rich and the poor increase but also wage gaps widen, adding to the redistributive problems generated by the switch to funding. When looking at the possibility to compensate the higher income inequality, we find that general equilibrium effects triggered by more funding increase the share of the population against redistribution. This highlights a potential conflict between enhancing redistribution and funding.

The paper is organised as follows: Section 2 provides the basic economic set-up. Section 3 analyses the impact of the social security reform and it discusses the policy implications of our findings. Section 4 concludes.

## 2. The basic set-up

### 2.1. Consumers and government

We consider a two-period OLG model of a closed economy populated by a continuum of heterogeneous agents indexed by  $j$ . When young, agents consume, save and decide whether or not to invest in human capital: if they do, they

<sup>2</sup> When considering prefunding of social security, the transition from a pay-as-you-go to a fully funded system is a critical issue and has been the subject of substantial analysis (see for instance Breyer, 1989; Homburg, 1990; Feldstein, 1998). References on risk issues include Diamond and Geanakoplos (2001) and Campbell and Feldstein (2001). On political feasibility see for instance Conesa and Krueger (1999), Leers et al. (2001), Sinn and Uebelmesser (2002).

<sup>3</sup> van Groezen et al. (2002) can be interpreted in this light.

<sup>4</sup> Kotlikoff et al. (2002) simulate the general equilibrium effects of privatising the US Social Security system under agents' heterogeneity in a framework where the key elements of our model are absent.

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