Monday 24th August, 2020
VALENTINAS RUDYS

Stylized Social Security Reforms and Labor Market Frictions

Introduction

Social Security (SS) plays a very important role for millions of Americans. In fact, it covers over 60 million elderly Americans and provides 33% of all elderly income (SSA, 2018). Among elderly Americans who claim SS benefits, half of married couples and 70% of unmarried individuals rely on SS for half or more of their income (SSA, 2018). Moreover, SS is attributed to significantly lowering poverty rates among elderly Americans (Engelhadt and Gruber, 2006). Unfortunately, the current SS program unsustainable as increasing share of population is in retirement. The current level of SS benefits are expected to last only until 2034 after which they are expected to only be able to pay 77% of the current benefits if no other reforms take place.[1]

A multitude of researchers have studied ways in which the SS program could be reformed and how those reforms would affect the current and the future elderly Americans.[2] Typically, researchers employ overlapping generations (OLG) models to study fiscal policy reforms. An OLG model is a framework that typically assumes an economy populated by many individuals (agents) who live for a certain number of years trying to maximize their well-being making consumption, saving and work decisions. Due to computational complexity of these models, researchers are required to make a set of relatively strong assumptions about agent heterogeneity, decisions they can make, the number of possible situations they can be in, markets, and other factors in the economy. While simplifying assumptions are useful in making the models solvable, they often reduce the dynamic effects of the object of study.

Typically, the labor market is assumed either to be perfectly competitive or exogenous (predetermined by the modeler). However, recent literature suggests that labor market imperfections matter for modeling Social Security reforms.[3] To capture these imperfections in my model, I allow a less restrictive and more dynamic labor market[4] in an otherwise a typical multi-period overlapping generations model with heterogenous agents. A more detailed labor market allows for a more dynamic interaction and feedback effects between the decisions of the employed, unemployed, retired and the firm. These changing decisions include labor supply, job search, saving, retirement timing among other, all of which are critical to sustainability of Social Security program. In the model, the labor market outcomes are completely determined by the endogenous decisions of the agents within the model. Moreover, such framework also allows competition and possible displacement of some workers by others.[5] Together, these unique factors contribute to painting a more accurate picture of the impact of reforms.

Model

The model is populated with infinitely many overlapping generations of agents who are born each period and live up to 18 (equivalent age of 100) periods facing uncertain mortality. Through their lives before retirement, agents are either unemployed or employed. Unemployed agents make consumption, saving, and job-search decisions. Employed agents make consumption, saving and labor supply decisions. At a specific age, agents in either labor market state can choose to retire and start claiming social security benefits. Delaying retirement guarantees higher benefits for the entirety of retirement. Retired agents only make consumption and saving decisions.

There exists one profit-maximizing firm that employs all working agents. In each period, it posts an optimal number of vacancies to replace the agents who lose jobs due to exogenous factors and those who retire. It also rents capital from agents who hold it paying them the market interest rate.

The government collects consumption, labor income and capital gains taxes and provides social security to elderly who claim benefits and unemployment insurance benefits to those who are unemployed.

The unique focus of this model is in the dynamic labor market. The firm posts a number of vacancies that it finds optimal while the unemployed apply for the vacancies. Following a Cobb-Douglas matching function, some of the unemployed get successfully hired for the vacancies. Others stay as unemployed and can retry job-search in the next period. Labor

[1] The 2019 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds, April 2019, https://www.ssa.gov/OACT/TR/2019/tr2019.pdf

[2] See De Nardi, Imrohoroglu and Sargent (1999),Imrohoroglu, Imrohoroglu and Joines (1995, 1999), Imrohoroglu and Kitao (2012), Kitao (2014), Nishiyama (2015).

[3] See Attanasio et al. (2007), Krueger and Ludwig (2007), Lucas (2007), De la Croix et al. (2013).

[4] Search-and-matching models are typically used to study labor market phenomena.

[5] See discussion about worker substitutability by age by Chybalski and Marcinkiewicz (2014) and Kalwij, Kapteyn, and De Vos (2010).

vrudys.com ✉ vrudys@fordham.edu

market outcomes - which and how many agents get employed - are determined within the model.

Aging and Policy Reforms

After calibrating the model to match employment by age group in the US in the year 2000 and solving for the steady state solution of the economy, I impose aging that resembles demographic shift experienced in the US. Without any policy reforms, an increased old age dependency ratio would lead to a relatively large on-going budget deficit. I consider 4 stylized fiscal reforms that would lead to a balanced government budget: (1) increase in income tax (2) increase in capital gains tax, both of which would allow to preserve the current level of benefits, (3) decrease in social security benefits, (4) delay of benefits, both of which would allow to keep the funding of the program unchanged.

Results

Comparison of the steady state equilibrium economy under each of the four reforms indicates that an increase in taxation (especially, labor) to cover the budget deficit leads to a significant decline in the labor supply, capital accumulation, and consumption in the long run. This is because high labor taxation reduces the incentive to work while also affecting the ability to accumulate capital. Lower labor and capital supply leads to lower production and consumption in the long run. On the other hand, decreasing or delaying social security benefits lead to significantly higher labor supply, capital accumulation, consumption and average well-being. Lower benefits in retirement incentivize agents to increase labor supply and save more during prime working years. Higher capital holdings allow for higher production, higher employment and consumption in the end. While inclusion of health shocks, age-dependent productivity, inequality may slightly alter the results; the results are not likely to change qualitatively.

	Ref1	Ref2	Ref3	Ref4
K	-	-0.2%	7.7%	6.6%
N	-	1.9%	4.3%	5.4%
C	-	2.2%	3.6%	3.4%
E	-	0.3%	1.5%	9.1%

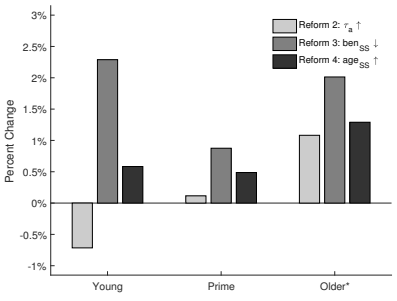
K: aggregate capital, N: aggr. labor supply, C: aggr. consumption, E: aggr. employment.

New Findings

The result that labor force participation and private saving incentivizing policies lead to higher labor supply, capital accumulation, and consumption in the long-run is not a novel finding in similar theoretical research. However, a more complex and dynamic labor market introduces new granular interactions between the agents in the model. To highlight the added value of this model, I compare it to similar models but with simplified labor markets. A dynamic labor market of this model suggests new channels which may amplify the increases in long-run positive outcomes when labor force participation and private saving policies are employed. First, increased aggregate capital holdings reduce the interest rate. Lower interest rates induce the firm to rent more capital which increases the marginal product of labor (MPL). Since the firm profits by taking a part of the MPL, it finds it optimal to increase the number of job openings which leads to higher employment levels across the age groups. Second, lower benefits incentivize higher job search effort and delayed retirement which increases the overall number of job-seekers and their aggregate job search effort. This increases the potential profitability of a marginal vacancy inducing the firm to increase the number of job openings. Increased job search and number of vacancies increases the job matches and overall employment. Third, simulation results suggest that fiscal reforms may affect younger worker displacement. I find that when the decrease in interest rate is large enough, older worker increased employment may be accompanied by increased employment of the young. However, older worker increased labor market participation may displaced some younger workers if the decrease in interest rate is not sufficient.

Conclusion

Due to an increase in share of the older population, Social Security in the US and similar pay-as-you-go public pension programs in other developed economies are becoming unsustainable. I build an OLG model, augmented with a dynamic labor market, and test four stylized fiscal reforms. In line with previous research, I find policies that reduce or delay old age benefits lead to better long run economic outcomes compared to increased taxation to keep the current level of benefits. The model suggests additional labor market channels through which labor force participation and saving incentivizing policies further amplify the beneficial outcomes of such policies. The policy reform simulations also suggest that policymakers should not be worried about younger worker displacement when implementing policies that incentivize elderly to stay longer in the labor force as long as policies also create incentives for private saving which creates a downward pressure on the interest rate.
The main finding is that ignoring labor market frictions may bias the fiscal reform evaluation. By assuming away a dynamic labor market as in previous research regarding Social Security, important labor market channels which affect the economic outcomes in the long run are muted.



Employment by age group. Young, prime and older workers represent 20-25, 30-50, 55-65 year-old agents, respectively. Results are relative to Reform 1. Labor supply by age group is qualitatively identical.