

2009 Study on the Privatization of Social Security Proposal to NSF program on Social and Economic Sciences (SES)

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I. Background and Overview

Privatization of Social Security has become an increasingly prominent debate in the American political realm as well as amongst its citizens. The merits of the program have been debated since its inception, with critics such as Republican Alf Landon in his 1936 presidential campaign calling the program "a cruel hoax". The program purports to be the largest annual transfer of wealth, and in 2008 total benefits of \$625 billion were paid out versus income (taxes and interest) of \$805 billion. 162 million American and employers paid into the program and 51 million received benefits¹. Different estimates have been put forward as to when the program will actually begin running deficits and how serious the problem is, but the general consensus² (given the aging population demographics, the increase in life expectancy, and current / expected low birth rates) is that the program will begin to face into trouble around 2018.³ One suggested solution to the potential "crises" has been the idea of complete or partial privatization. The ramifications of privatization are far reaching, and given its importance the decision to privatize must be carefully studied and the benefits versus costs efficiently and effectively weighed.

¹2008 Social Security - Trustees Report Summary Press Release available at: <http://www.ssa.gov/pressoffice/pr/trustee09-pr.htm>

² Some argue that indeed there are no expected problems and the issue has been blown out of proportion and the debate surrounding privatization is really founding on the idea of the expected windfall that investment firms stand to make if Social Security is privatized. See for example *The False Promise of Social Security Privatization* Miron and Murphy (2001) for more details or Krugman, Paul (December 7, 2004). "*Inventing a Crisis*". [The New York Times](http://www.nytimes.com).

<http://www.nytimes.com/2004/12/07/opinion/07krugman.html?scp=539&sq=&st=nyt>.

³ 2009 Social Security OASDI Trustees Report - Overview available at: <http://www.ssa.gov/pressoffice>

The conservative position is often pro-privatization. Their primary argument revolves around the right of an employee to control the fruits of their labor, and they claim the current scheme forgoes potential higher returns that could translate into greater benefits⁴. The liberal position is typically anti-privatization, and is generally prompted by the idea that first and foremost privatization is not an answer to the funding shortfalls. Privatization opponents believe that as a social program it must provide a minimum level of income to retirees, which privatization may actually hamper⁵.

We do not take the view that privatization is either good or bad, rather we plan to attempt to analyze some of the externalities that may have not been brought into the debate that have important repercussions. In particular, using Micro-simulation, this study will explore not only the effects of privatization on the overall aggregate value of retirement accounts, a study possibly better achieved via trading general equilibrium and/or forecasting models, but rather the externalities of privatization and how consumer savings, supplemental retirement and planning decisions may be affected, as well the impact of changes to the economy over time. Using Microsimulation with the rich cross sectional data regularly collected by the Census Bureau and the Social Security Administration we plan to highlight the choices that various types of households (i.e. income class, family demographic, and other household survey data) may ultimately make if Social Security is ultimately privatized. Microsimulation allows us to avoid the necessity of making general assumptions of decisions of a “typical” individual.

II. Problem Statement

⁴ For an example of a privatization proposal see *Privatizing Social Security the Right Way* by Laurence Kotlikoff, available at http://www.independent.org/pdf/tir/tir_05_1_kotlikoff.pdf or *Social Security Privatization: A Structure for Analysis* By Olivia s. Mitchell and Stephen P. Zeldes, available at <http://www.jstor.org/stable/pdfplus/2118153.pdf>

⁵ *Twelve Reasons Privatizing Social Security is a Bad Idea* drafted 12/14/2004, available on <http://www.socsec.org/publications.asp?pubid=503>

“Microsimulation as an instrument to analyze and forecast the individual impacts of alternative economic and social policy measures are surveyed in this study.”(Metertz 1994)

Microsimulation studies have shown their utility and already have made major contributions to the development of public policy concerning tax, social programs, and various economic policies. These models have been utilized to both determine whether or not particular policies should be implemented, as well as evaluate hypothetical situations and variations of proposals. The evaluation of the effects of privatization of Social Security is an area naturally suitable to exploration with Microsimulation methods. However, prior studies have generally ignored the behavioral decisions that individuals make when given direct control, oversight, and transparency of their retirement account⁶. The proposed simulation model we aim to build will not only explore the various types of privatization proposals on ultimate retirement savings, but also reveal any changed on household choices. Questions the proposed model will attempt to answer include: is there an optimal mix between privatization and government sponsored benefits, how many privatization choices should be offered, how does a guaranteed level of payment affect savings and other investments choices, will consumers consider themselves wealthier if they have more control and transparency and thus increase spending, should the funds be available for borrowing against if the geared investments are also retirement focused, and will individuals allocate a greater portion of the current wealth into private retirement accounts. The Microsimulation model will account for the heterogeneity in the cross sectional data and the evolution of any effects over time. Our aim is to build a model in which both pro/anti privatization researches can input their assumptions and quickly

⁶ Anderson, 1999, Citro and Hanushek, eds., 1997, Hollenbeck, 1995, Technical Panel on Methods and Assumptions, 1999 all support the belief that current microsimulation models poorly capture the interactions between policy and behavioral changes and between those behavioral changes and the performance of the macroeconomy.

see what the ramifications are for a variety of consumer's choices as well as the ultimate positions of retirees. Providing an accessible tool/ platform for proponents on both sides of the debate will provide the governing agency an unbiased source for comparison when evaluating policy decisions. A key difference between the proposed model and prior models is that we will incorporate the effect of privatization on specific individual decisions. For example, if people feel wealthier privatization may boost consumer spending and will this in turn increase GDP. Questions such as whether individual will invest in overly risky portfolios, and what the ideal mix of investment options to maximize potential retirement benefits while allowing for a guaranteed a minimum level of payouts during retirement can also be tested with the proposed model.

IV. Introduction of Microsimulation Models

Simulation models and in particular Microsimulation models have been increasingly incorporated within the analyses of economic and social policy decisions. Microsimulation models are built upon micro units, such as low-level population data, typically the records of individuals (although a unit can represent a family/household/firm, tax units, or as decision-unit such as a firms or community) from a national sample survey conducted by an organization such as the national Bureau of Statistics. Aggregating the actions and reactions of a diverse cross section of these units presents a picture of the overall impact, as well as the distribution across groups, of policy changes. These models which analyze the impact of social and economic policies by simulating the behavior and characteristics of individual decision-making units were initially developed Orcutt's (1957), and have been subsequently improved upon since seminal his work. Microsimulations are able to highlight the subtleties of many policy changes, and the beauty of these models is their ability to easily provide a platform to test various hypothetical scenarios and variations of a policy proposal. An overview, technical description, and examples of these models in practice can be found in

Hardning (1996) and Gupa and Kapur (2000). One of the most important advantages of large scale Microsimulation models is their ability to drill down to a narrowly defined range of individuals or demographic groups. These models can both incorporate the heterogeneity in the population and are able to highlight the impact on these specific groups.

Analyzing a large cross sectional dataset may be difficult in its own right, however incorporating a time element and projecting the behavior of individuals over time, including changes in the population dynamic (known as Dynamic -Microsimulation models), and then linking ultimate effects to a particular action is challenging. The longer the time period the greater the modeling difficulty. Thus, projecting the impact of Social Security policy over a 60+ year horizon requires a sophisticated microsimulation model. Behavioral reactions are typically not incorporated and assumed to be exogenously determined for simplifying purposes, we aim to address endogenous such variables.

III. Previous Research

Commissioned by the Social Security Administration (SSA) office, the report “Long Term Model Development for Social Security Policy Analysis”⁷ reviews the available microsimulation models and highlights the benefits and flexibility of the Projected Cohorts Model (PCM) model (discussed below) which is the basis for our proposed model. Additionally, the authors suggest a number of potential model improvements including the augmentation of the PCM model with other macroeconomic models that are able to provide a more realistic simulations and thus more accurate ramification for privatization. The report does not in particular discuss Social Security privatization, rather it focuses on the tools to better adapt current range of microsimulation models to account for real world variables.⁸

⁷ by Eric Toder, Melissa Favreault, John O'Hare, Diane Rogers, Frank Sammartino, and Karen Smith of the Urban Institute and Kent Smetters of the University of Pennsylvania, and John Rust of Yale University. available at http://www.urban.org/UploadedPDF/sspolicy_analysis.pdf

This study was an important influence in our decision to build our model upon the PCM and also highlighted the extensive capabilities the model can accommodate when combining macroeconomic models and consumer choice models with the PCM. Most importantly the study highlighted all the ideal capabilities a model would contain, from which we choose which capabilities are most integral in an update model as well as feasible.

Previous research utilizing Microsimulation models with regards to Social Security privatization generally fall into three categories:

- Studies that explore the effect on particular population groups. (Moore 2000 on minorities and low income earners; Davies and Favreault 2004 on the elderly; Wasow 2002 and Spriggs 2004 on African Americans; Gil, Greenstein, and Kamin 2004 on Latinos; Estes 2004 on women; Duleep and Dowhan 2008 on immigrants)
- Studies that focuses and the general wealth and level of retirement benefits under a privatized versus non-privatized system (Kotlikoff 1996; Copeland 2000; Burtless 2002)
- Reviews of what the privatization effects had in other countries. (Thompson 2001)

There have also been a number of books written on the subject such as *Social Security Reform* by Peter A. Diamond and *Privatizing Social Security* by Martin Feldstein. Because this issue is such a prominent and important debate the amount of information available is extensive, however when sorting through prior studies and references it is important to keep in mind the motivation of the authors or the sponsoring entity. Because privatization can potentially yield a windfall in earnings for brokerage firms and banks, affects many heterogeneous groups within the population, can be instituted in various means, and is complicated in nature comparison amongst studies, microsimulation models, and results derived from other countries are difficult.

IV. Available Microsimulation Models

There have been a number of Microsimulation models, some sponsored by the Social Security Administration, that aim to project results from changes to Social Security policy. The simplest are representative worker models which simulate how Social Security reforms would affect the lifetime taxes and benefits of a worker with an assumed “representative” lifetime pattern of earnings. The most theoretically sophisticated are stochastic general equilibrium models that permit estimation of the economic effects of policy changes by representing household labor supply and saving behavior as the solution to a complex optimization problem, given household earnings capacity and initial wealth and government policies (Toder et al. 2000).

The four most utilized Social Security Microsimulation models are⁹:

- The Genuine Microsimulation of Social Security and Accounts (GEMINI)¹⁰
- The Model of Income in the Near-Term (MINT)¹¹
- The Cornell Microsimulation Model (CORSIM)
- The Projected Cohorts Model (PCM).

Genuine Microsimulation of Social Security and Accounts (GEMINI) is a Microsimulation model developed by the Policy Simulation Group (PSG). GEMINI simulates all types of Social Security benefits including retired workers’, spouses’, survivors’, and disability benefits. The model itself is built upon two other PSG models, the Social Security and

⁹ Related non-socials security micro simulation models that were also considered are provided in appendix A , but modification of a Social Security specific model was deemed more cost effective and practical

¹⁰ For a full description of the model and some of its key results see the GAO Report to Congressional Requesters *Social Security Distribution of Benefits And Taxes Relative To Earnings Level*, June 2004 available at www.gao.gov/cgi-bin/getrpt?GAO-04-747

¹¹ See Mint Modeling Income In The Near Term: The U.S. Social Security Administration Near Term Retirement Income Model available at http://www.soa.org/files/pdf/Chapter_8.pdf for a in-depth analysis of the models capabilities

Accounts Simulator (SSASIM) and the Pension Simulator (PENSIM), which has been developed for the Department of Labor. GEMINI relies on SSASIM for economic and demographic projections and relies on PENSIM for simulated life histories.

The Model of Income in the Near-Term (MINT) is a static microsimulation model, but since its development in the mid-1990s by analysts in the Social Security Administration Division of Policy Evaluation (DPE) later versions have allowed for added model flexibility. MINT projects the income in retirement¹² of a specific group of forecasted social security retirement beneficiaries who reach the age 62 in 1993 through 2022 by projecting retirement income from Social Security as well as other sources, such as savings. Although MINT produces a simulated microdatabase with projected future incomes, it is not a true dynamic microsimulation model because it uses statistically estimated regression equations to project future demographic states of the individuals in a sample based on the lifetime path of incomes and assets of individuals in earlier cohorts in the sample. A weakness of these projections is that they assume that the projected income and other assets are based on past patterns of income and assets of similar individuals in earlier cohorts with little variability.

CORSIM is a dynamic micro-simulation model that generates a representative sample of lifetime earnings for various demographic groups. The model computes the lifetime net benefits (benefits less taxes) paid to different cohorts. CORSIM starts with a representative sample of Americans and then evolves this sample demographically and economically. Specifically, it ages, marries, divorces, fertilizes, educates, employs, reemploys, retires, and kills original sample members and their descendants over the modeling period.

PCM uses as its base data a sample drawn from an exact match of the 1994 U.S. Census Current Population Survey (CPS) and the Social Security Earnings Records (SSER) of

¹² The model's regression equation account for mortality, marriage/remarriage, divorce, widowhood, disability, earnings, assets, asset income, pension coverage and accruals, pension benefits, retirement decision, and earnings after retirement

individuals who became eligible for Social Security retirement benefits in 1992 and thus were born in 1930. Building upon the 1930 birth cohort, it projects earnings histories of future groups by making adjustments to the baseline group. An advantage to this model is that it incorporates the actual earnings and demographic history of a cohort in order to simulate entire lifetime of earnings of other groups. By adding models of other sources of income (pensions and income from non-pension saving) and linking the PCM with previously developed macro-economic models a compressive and realistic model that seem best suited for the evaluation of Social Security policy changes can be developed. A major benefit of this model is that it uses realized data and given we can observe the decision choices of the sample prior to retirement we can better project what a combination of macroeconomic and behaviors model incorporation would result from any Social Security policy changes. Of note is that there is a feedback loop between these various models as changes to Social Security policy may affect consumer decisions which flow into economic repercussions and ultimately into once again into the value of these accounts.. The primary weakness of this model is the reliance on the 1930 cohort to project the future earnings of later groups. Additionally, the model in its current forms does not incorporate other sources of retirement savings such as pensions plans. We aim to include these alternative sources of income and expect that they have a significant influence on the terminal value of private retirement accounts and will model the relationship between the two sources of retirement's savings.

Related to Social Security is Supplemental Security Income (SSI), a program initiated to help the poorest receipts of social security benefits. When evaluating the difference between a privatized system, or a flavor of privatization, we plan on comparing retiree positions whilst including SSI benefits. SSI benefit modeling will be built upon the Supplemental Security Income (SSI) Financial Eligibility Model developed in the Division of Policy Evaluation of

the Office of Research, Evaluation, and Statistics.¹³ Lastly, SOCSIM a detailed Social Security benefit calculator will be used as an input into the Microsimulation model.

In conjunction with the overall microsimulation model the various forms of privatization proposal must be evaluated. Thompson (2001) documents the variety of structural and administrative arrangements that either have been proposed for individual account systems in the US or have been adopted in other parts of the world. Using the details provided by Thompson (2001) we can test the various types of structural reforms and in tandem the behavior repercussions of the policies. Similarly, Williamson (1996) draws on evidence from four Latin American countries that have privatized their public pension schemes (Chile, Mexico, Bolivia, and El Salvador) and four that have partially privatized (Argentina, Uruguay, Colombia, and Peru) when exploring the benefits of privatization. Williamson (1996) and provides various criteria for comparing the overall costs/benefits of various proposals which we aim to use as a template.

V. Behavioral Analysis

A primary goal of the improved model is to project and incorporate behavioral decisions related to portfolio choice and its relation to a household other investment assets. If direct access to retirement benefits are provided retirees may shift their allocation of other retirement assets. The effect of Social Security changes to other assets classes clearly depends on a range of outlooks and assumptions that will be incorporated into the simulation model. Another behavioral element that we aim to include is the propensity of households to incentives to save. Households may alter their saving patterns in response to changes in both the projected amount and updated riskiness of future income resulting from privatization. On

¹³ See Modeling SSI Financial Eligibility and Simulating the Effect of Policy Options from Social Security Bulletin, Vol. 64 No. 2 (released September 2002)

one hand, because privatization increases the risk and uncertainty in ultimate retirement benefits a move to privatize may also increase precautionary saving, thus reducing real spending and economic growth. On the other hand, the greater transparency and increase in the projected growth rates of retirement savings may increase consumer confidence and spending, and in turn growth rates and even potentially interest rates. An important improvement of the proposed model is that by incorporating economic growth models into the analysis and allowing retirement savings to be invested in real growth opportunities such as stocks and bonds will result in economic growth and in turn affect both the value of retirement savings and other consumer driven choices. Lastly, work incentives may also be affected by privatization. There is a trade-off between efficiency losses due to a distortion of incentives, termed differently the closer the relationship between contributions and benefits the clearer the benefits the greater the incentive to work harder. (Diamond, 1977; Laurence Kotlikoff, 1995). Privatization would increase the linkage and thus possibly increase the incentive for dedicated work.

In order to project savings implications the PCM will be augmented with the Life Cycle Model (LCM). The basic premise of the LCM is that individuals save in order to replace the decline in income that accompanies old age. The model provides predictions about the paths of consumption and saving, given any pattern of lifetime earnings and projected retirement income. Privatization would affect the savings decisions in multiple ways; firstly it affects the expected retirement income. Secondly, because of the added fluctuations in retirement account values other non retirement related savings figures may also be affected to potentially counterbalance any new risks.

VI. Expected Benefits and Capabilities of the Proposed Model

Advocates of privatization often claim that privatization would increase the wealth of Social Security users and stimulate consumer spending in turn increasing economic growth.

Additionally, a privatized system would provide new funds for investment in the economy. However the relationship between savings, spending, and economic growth have yet to be incorporated into a single Microsimulation. Related issues that the model may be able to elucidate are what the transition costs to the new system are and how best to implement any proposed changes (i.e. in stages or all at once). The proposed models will allow policy makers to estimate the impact of policy changes on income and lifetime welfare of different age cohorts of the population and sub-groups within them (by income level, race, sex, and level of education). It will be flexible enough to incorporate alternative assumptions about demographic changes and behavioral responses to policies. On a technical level, given the incorporation of various models and the large sample size the computing cost of the model may be substantial and a cloud or cluster of computers will be used to implement the model.

Appendix A: Microsimulation Models

Static:

TRIM (Transfer Income Model) (Urban Institute)

MATH Model (Micro Analysis of Transfers to Households) (Mathematica Policy Research)

HITSM (Household Income and Tax Simulation Model) (Lewin Group, formerly ICF)

U.S. Treasury Individual Income Tax Simulation Model (OTA Model)

Dynamic:

DYNASIM2 (Dynamic Simulation of Income Model) (Urban Institute)

PRISM (Pension and Retirement Income Simulation Model) (Lewin Group, formerly ICF)

Wolf Model for Simulating Life Histories of the Elderly (Urban Institute, under development)

DYNACAN - Canadian model (Canada Office of Supervisor of Financial Institutions)

PIMS (Pension Insurance Management System) (PBGC microsimulation model of firms)

Bibliography

- Copeland, Craig. "Evaluating the Archer-Shaw Social Security Proposal." *SSRN eLibrary*.
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=265229.
- Cronqvist, H., and R. H Thaler. "Design choices in privatized social-security systems: Learning from the Swedish experience." *American Economic Review* (2004): 424–428.
- Davies, Paul S., and Melissa Favreault. "Interactions Between Social Security Reform and the Supplemental Security Income Program for the Aged." *SSRN eLibrary* (February 2004).
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=546643.
- De Mesa, A. A., and V. Montecinos. "The privatization of social security and women's welfare: Gender effects of the Chilean reform." *Latin American Research Review* (1999): 7–37.
- Diamond, P. A. *Privatization of social security: Lessons from Chile*. NBER, 1993.
- Diamond, Peter A. *Social security reform*. Oxford University Press, 2002.
- Duleep, Harriet Orcutt, and Daniel J. Dowhan. "Incorporating Immigrant Flows into Microsimulation Models." *SSRN eLibrary*.
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1193011.
- Edwards, S., and A. C Edwards. "Social Security Privatization Reform and Labor Markets: The Case of Chile*." *Economic Development and Cultural Change* 50, no. 3 (2002): 465–489.
- Estes, C. L. "Social Security privatization and older women: A feminist political economy perspective." *Journal of Aging Studies* 18, no. 1 (2004): 9–26.
- Feldstein, M. *Privatizing social security*. University of Chicago Press, 2000.
- Gupta, Anil, and Ann Harding. *Modelling our future*. Emerald Group Publishing, 2007.
- Gupta, Anil, and Vishnu Kapur. *Microsimulation in government policy and forecasting*. Elsevier, 2000.
- Kotlikoff, L. "Simulating the privatization of social security in general equilibrium." *Privatizing social security* (1996).
- Kotlikoff, L. J. "Privatization of social security: How it works and why it matters." *Tax policy and the economy* (1996): 1–32.
- Kotlikoff, Laurence J., Kent A. Smetters, and Jan Walliser. "Social Security: Privatization and Progressivity." *SSRN eLibrary* (February 1998).
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=226175.
- Mitchell, O. S., and S. P Zeldes. "Social security privatization: a structure for analysis." *The American Economic Review* (1996): 363–367.
- Moore, Kathryn L. "Partial Privatization of Social Security: Assessing Its Effect on Women, Minorities, and Lower-Income Workers." *SSRN eLibrary*.
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=262190.
- Punzo, Lionello F., Jacek Leśkow, and Martín Puchet. *New tools of economic dynamics*. Springer, 2005.
- Spielauer, Martin, and Landis Mackellar. "Social Security Reform" (2002).
<http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.57.7813>.
- Thompson, Lawrence H. "Administering Individual Accounts in Social Security: The Role of Values and Objectives in Sharing Options." *SSRN eLibrary*.
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=256580.
- Williamson, J. "Should Women Support the Privatization of Social Security?" *Challenge* 40, no. 4 (1997).
- Williamson, John B. "Privatizing Public Pension Systems: Lessons for the United States from Latin America." *SSRN eLibrary* (November 2000).
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=252053.