Econ 698s: Lecture Notes
Introduction to the Economic Analysis of Social Insurance
Professor John Rust

Objectives of course:

1. **Issues:** Understanding current financing issues arising from the "demographic shift". Which system is "better", a pay-as-you-go or a fully funded system? This course will also devote a lot of attention to recent debate over "privatizing" social security.

2. **Institutions:** surveying the diversity and noting underlying similarities in social insurance institutions around the world. How much of differences in behavior (retirement, disability, unemployment, etc.) can be attributed to differences in incentives created by different social insurance institutions?

3. **Theory:** Why is the government in the social insurance business? What can economic theory tell us about the reasons for government involvement and the structure of "optimal" social insurance institutions? Specific tools to be covered:

   3.1 Life-cycle theory of consumption/savings and labor/leisure decisions

   3.2 General equilibrium overlapping generations models

   3.3 Information economics and the problems of moral hazard and adverse selection

   3.4 Mechanism design theory

   3.5 Optimal tax theory

4. **Computation:** computation begins where theory leaves off — computer models enable us to study larger, more detailed and more realistic theoretical models that aren't amenable to closed-form solutions or whose solutions are hard to characterize theoretically. Specific computational methods that will be covered in this course:

   4.1 Dynamic programming methods for solving stochastic lifecycle optimization problems

   4.2 Numerical methods for solving dynamic general equilibrium and overlapping generations models

   4.3 Numerical methods for solving mechanism design and optimal tax problems

5. **Empirical:** a heavy emphasis on empirical studies that cast light on the key practical and theoretical issues connected with social insurance, including:

   5.1 Do individuals behave "as if" they were solving life-cycle optimization problems, or does a significant component of the population behave myopically or irrationally?

   5.2 Does a pay-as-you-go social security system reduce savings and the aggregate capital stock?

   5.3 Does social security constitute a "tax" that reduces labor supply among young? Is social security responsible for the worldwide trend towards early retirement?

   5.4 What do cross-country comparisons tell us about the impact of different social insurance institutions? Has privatization in countries such as Chile been successful?

Summary of the "helicopter tour"

1. **Social insurance institutions are complex.** These programs involve an array of partially overlapping and complimentary benefits including benefits for retirees and their survivors and dependents, unemployment and disability benefits, worker's compensation, medical insurance, and welfare benefits.
2. **What risks do social insurance institutions insure against?**
   - 2.1 longevity risk (old age insurance)
   - 2.2 health risks (medical insurance, disability, worker's compensation)
   - 2.3 job risks (unemployment insurance and the implicit insurance against lifetime earnings risk provided by progressive tax and transfer aspects of social insurance institutions).
3. **Why is the government in the insurance business?**
   - 3.1 **Paternalism:** individuals are myopic and unable to provide for themselves financially.
   - 3.2 **Market failure:** information problems of moral hazard and adverse selection leads to breakdowns in private markets for annuities and disability and unemployment insurance so government has a role to help complete these markets forcing individuals into mandatory insurance (risk pooling) plans. Also government intervention (or at least regulation) is required to avoid other problems associated with competition, such as false advertising and consumer fraud, and firm's reneging on promises due to bankruptcy, fraud, etc.
   - 3.3 **Redistribution:** societies are interested in obtaining more egalitarian distributions of income and wealth than emerge under *lassiez faire* and social insurance is an effective way to redistribute wealth over the entire life-cycle.
   - 3.4 **Administrative efficiency:** competition by financial intermediaries may lead to costly and inefficient advertising and competition that can be eliminated by making the government a monopoly provider of social insurance.
4. **Social insurance institutions in "advanced" (OECD) countries share many similar features.** In general OECD nations have large, well-developed social institutions, some of which are over 100 years olds. Less developed countries have small, nascent social insurance institutions and still rely heavily on "informal" arrangements including family transfers.
   - 4.1 Are similarities a result of similarities in the basic social and demographic structure in OECD countries, or is it a result of imitation?
   - 4.2 Main difference in social insurance institutions in OECD countries is the level of the "safety net": European nations tend to be "welfare states" with high benefit levels and tax rates whereas U.S. and other countries in north and south america have lower safety nets due to a fear of socialism and the welfare state and a greater belief in lassiez-faire, individual self-reliance and initiative.

5. **Implications of the "aging problem".** Social insurance institutions around the world are facing the need for major adjustments due to the *demographic shift:*

   5.1 **The initial effect of the baby boom.**

   5.2 **The secular trend in decreased birth rates.**

   5.3 **The secular trend in increased life expectancies.**

   These two factors affect the "dependency ratio" that have have negative implications for the financing of pay-as-you-go social insurance institutions: to restore fiscal balance in these programs either benefits of older beneficiaries must fall, or tax rates on younger workers must rise.

6. **Is there an "old age crisis"?** I have argued that in the United States, current forecasts do not suggest that the U.S. Social Security system is in imminent danger of "going bust". In part this is a result of changes in the program in 1983 that:

   6.1 **Increased tax rates.**

   6.2 **Decreased Benefit payments.**

   These changes resulted in a rapid accumulation in the social security trust fund. Although initial forecasts of the eventual buildup of trust fund balances were wildly over-optimistic, even under much more pessimistic subsequent forecasts, the amount of additional tax increases and benefit reductions necessary to maintain long run fiscal solvency of the program, while significant, are not large enough or looming immediately enough that it would accurate to characterize the U.S. as facing an "old age crisis".

   However less favorable demographics combined with more generous social insurance institutions do lead to more serious problems in many of the European OECD countries and Japan. The very limited social insurance insititions in developing countries combined with rapid aging, could lead to an old age crisis in LDCs as documented in World Bank report, *Averting the Old Age Crisis.*

7. **Benefit of "crisis mentality":** even if U.S. social security is not facing an imminent funding crisis, the public's perception that it will eventually "go broke" may have positive effects. Social security has always been a tremendously politically popular program that was regarded as the "third rail" of american politics (i.e. "touch it and you die"). In an era of favorable demographics when the baby boomers were young taxpayers, in an era of "stagflation" where equity returns were not keeping up with inflation, it was extremely foolhardy for any politician to propose "radical" reforms such as privatization. However recent financing problems in social security and medicare combined with the extraordinary recent returns to equities and the apparent success of certain latin american experiments in privatization such as Chile has made it politically feasible to consider significant reforms. 1996 Social Security Advisory Council considered a number of reforms including more radical proposals of "individual accounts" and the proposal to invest a portion of the Social Security trust funds in equities.

   7.1 Radical reform has already been enacted in the 1996 welfare reform bill that has greatly reduced the level of welfare coverage for America's poor by sharply reducing the level and duration of welfare benefits, creating much greater incentives to return to work.

8. **The "equity-efficiency" tradeoff:** a fundamental trade-off in setting the level of the social safety net. The more generous social insurance institutions in the European "welfare states" provide more egalitarian societies that offer individuals greater security, but at the cost of higher taxes and more distortions to incentives. Is it possible to quantify the efficiency costs of increased social security?

9. **The groping process in search of "optimal social insurance institutions".** Social insurance institutions emerged partially as a result of the failure of private markets to offer adequate insurance against risk. However initial program designs had many naive features resulting from mistakes by "well intentioned bureaucrats". Individuals then take advantage of the design problems and poor incentive features of these initial programs, leading to increasing tax rates, eventual taxpayer rebellion, and subsequent "retrenchment". This can be viewed as a sort of "political pendulum" where liberal administrations initially greatly expanded social insurance institutions and conservative administrations subsequently contract and retrench these programs, but often too far in the other direction. Will this "groping process" ultimately lead to dampened swings in the political pendulum, discovering "optimal" social insurance institutions that balance the equity-efficiency trade-off?

10. **Internal "crash-testing" of alternative social insurance institutions.** The groping process can be viewed as extremely expensive social experiments that are designed to test proposed improvements to social insurance institutions. Is there an alternative to this trial by error learning process? Suggest that more realistic computationally oriented economic models may permit much more inexpensive

11. **Debate about the "right" way to do policy modeling.** Martin Feldstein, one of the chief critics of the U.S. pay-as-you-go social security system and the savings and labor supply distortions it creates, advocates the use of simple models and "back of the envelope calculations" to guide policy making. He is skeptical of the reliability and the cost-effectiveness of large-scale computational models for policy making. On the other hand, in this course we will show that the main trend in academic research is towards the development of increasingly realistic and comprehensive computer simulation models of social insurance institutions.

12. **Debate about the "right" way to do empirical work:**

    12.1 **Calibration vs. estimation:** Many of the large scale computational overlapping generations models of social security have been "calibrated", i.e. their unknown parameters are chosen by a more or less informal procedure designed to make the models "mimic" reality according to some typically implicit, ill-defined metric. Econometricians criticize calibration for being *ad hoc,* incoherent and inefficient way to do inference and testing, but advocates of calibration reject typical notions of inference and testing. However econometricians have not been successful in producing computationally feasible methods for doing "rigorous" econometric inference for large scale general equilibrium models, leaving the gap that has been filled by the non-rigorous, ad hoc calibration approach. For the foreseeable future calibration may the best we can do if we are interested in studying the implications of large scale computational models of social insurance institutions.

    12.2 **Structural vs. Reduced-form estimation** It is feasible, although still very challenging, to do rigorous estimation and inference in "single agent" models that use dynamic life cycle models and dynamic programming methods to study individuals' "best responses" to different social insurance institutions. These models are partial equilibrium, but avoid the "Lucas critique" that reduced-form econometric models are subject to. On the other hand, structural models typically require a host of strong maintained optimality, rational expectations, and parametric functional form assumptions that many people find questionable. The "Princeton" and "MIT" schools of labor and public economics and applied econometrics are skeptical of the use of structural models in empirical work and rely on much simpler regression and instrumental variables modles and use policy changes as "natural experiments" or "instruments" to identify key behavioral parameters. Reduced-

form models have a decisive limitation that they cannot generally be used to predict how individual behavior will change in out-of-sample policy forecasting experiments whereas structural models can. Policy experiments are an extremely useful way to evaluate the accuracy of structural models, since the parameters of these models can be estimated prior to the change in policy and result in falsifiable forecasts of the policy change. Reduced-form models use the policy change to estimate key unknown parameters and thus policy experiments are more used for estimating rather than testing reduced form models.