ECON441: Political Economy of the Welfare State

Public Choice and the Modern Welfare State, On the Growth of Social Insurance Programs in the Twentieth Century

Abstract

In the 25 year period between 1960 and 1985, there was a great expansion of social insurance and transfer programs in all Western countries. The fraction of GDP accounted for by government expenditures approximately doubled in much of Europe and grew by 40%-50% in most other OECD nations. After 1985, there has been relatively little growth in the scope of the welfare state relative to other parts of the economy. This chapter surveys public choice and related research on the political economy of the welfare state.

There are essentially two strands of the literature. One stresses the extent to which institutions, voter interests, and ideological shifts account for the period of rapid growth. The other emphasizes the importance of interest groups, who lobby for extensions of the welfare state in order to profit from larger budgets, more generous transfers, or new spending by those receiving the transfers. This chapter surveys the literature and illustrates how an electoral model of the demand for social insurance can be constructed.

I. Introduction: Origins and Development of the Welfare State

A. National social insurance programs are roughly as old as Western democracy. In much of Europe, national social insurance programs were adopted shortly before broadly elected parliaments began to dominate policy formation.

i. Germany's social security program began in 1889, Sweden's in 1909, and the United Kingdom's in 1911.

ii. The social security programs of the United States and Switzerland were adopted somewhat later, in 1935 and 1947, respectively.

iii. These early programs were usually adopted by conservative or liberal coalitions and so, initially, could be said to be "liberal" in their general structure and benefit levels.[1]

B. Before the national income security programs were adopted, income insurance had been provided by families, private organizations (such friendly societies and churches), and by local governments.

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[1] The term "liberal" is used in its older European sense throughout this lecture. In 1900 European liberals tended to favor (nearly) universal suffrage, free trade, and modest social safety nets. In contemporary Europe, liberals are the right-of-center defenders of democracy, markets, and civic equality. In the United States, the term liberal refers to the left-of-center defenders of democracy, markets, and civic equality, many of whom would be considered moderate social democrats in Europe. Before World War I, there was not very much difference between European and U.S. usage, although significant differences emerged after that.

C. National programs were often associated with industrialization and its associated business cycles which often swamped (bankrupted) the traditional sources of social insurance.

D. Congleton (2007a) suggests that an efficient risk-pooling model of the demand for national programs of social insurance can explain many durable features of early national social insurance programs.

i. A "liberal" welfare state reflects personal demands for income insurance and economic advantages associated with national provision of income security relative to supply through private income insurance clubs and firms.

ii. An insurance explanation, rather than transfers, per se, is consistent with the level of funding and conditionality of the benefits provided, especially in the period before World War II.

iii. A social insurance rationale for both small and large welfare states is also broadly consistent with empirical evidence developed by Tanzi and Schuknecht's (2000), which suggests that only modest changes in the income distributions of OECD countries can be attributed to the size of national social insurance programs during the twentieth century.

iv. The main transfers associated with national insurance programs tend to be the implicit subsidies that low income persons receive regarding the prices of their income and health "insurance policies."

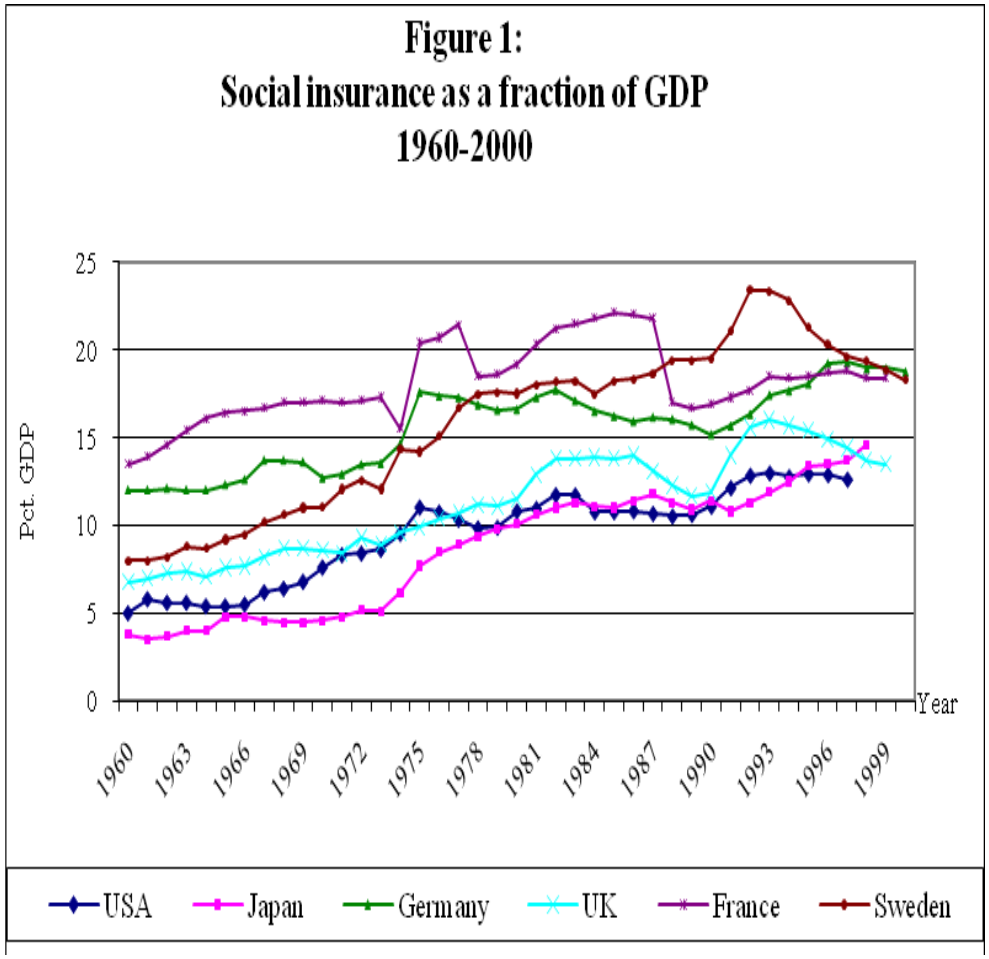
v. It should be kept in mind that the early social insurance programs were relatively modest in size and coverage, although they represented significant expansions of central government responsibilities.

E. If the welfare state is a "nanny" state with a relatively high "safety net" with very broad coverage, it emerged after World War II.

i. Between 1950 and 1980, social insurance programs increased from 4% to 13.4% of GDP in Japan, from 7% to 15% in the United Kingdom, from 12% to 18% in Germany, and from 13% to 18% in France.

ii. Similar programs in the United States rose from 5% of GDP in 1960 to 11% in 1980.

iii. The rapid expansion of those programs after World War II is more difficult to explain than their initiation.



F. The modern welfare state evidently reflects more than an increase in the private demand for social insurance.

G. The private demand for insurance tends to increase with income and with perceived risks. Income growth after World War II clearly accounts for part of the increase in government-provided income insurance.

i. However, unless social insurance is a luxury good, its income elasticity should be closer to one than three. The doubling and tripling of the size of these programs during the 1960s and 1970s relative to GDP requires much greater income elasticity.[2]

ii. In the early postwar years, changes in perceived risks are also likely to have played a role. Subjective assessments of risks are likely to have increased by the great depression and World War II.

iii. In most OECD countries, this increase in demand could be not expressed until after World War II was over and democratic governments were reestablished. Such increases in perceived risks, thus, would partially explain expansions in many national safety nets during the 1950s.

iv. As peace and prosperity replaced war and sacrifice, however, subjective risk assessments would tend to decrease and reduce the rate of expansion of social insurance programs.

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[2] See, for example, Mantis and Farmer (1968) or Gruber and Poterba (1994) for estimates of insurance demand. Both report positive coefficients for income that are consistent with a less-than unitary income elasticity for the demand for insurance.

v. By the late 1960s, one would have expected perceived risks to have stabilized or been reduced by peace and prosperity.

vi. Any downward trend in risk assessments would have been offset to some extent by increases in the average and median age of the electorate, because economic and health risks tend to increase with age.

H. Additional factors were evidently important.

i. Congleton and Bose (2010) suggest that rise of the modern welfare state occurred in large part because of ideological and institutional changes that took place after World War II.

ii. In general, ideology shifted in a leftward direction and political institutions were often modified in a manner that tended to make them more responsive to short term changes in voter preferences by weakening or eliminating second chambers in bicameral governments.

iii. An overview of their analysis is provided by today's lecture.

II. There are four major quasi-insurance programs in modern welfare states: public pensions, health insurance, unemployment insurance, and welfare programs

A. Government Provided and/or Subsidized Pensions

State pension programs can be considered a form of social insurance analogous to private annuities. In effect, the government uses tax revenues, often earmarked for such purposes, to provide retired and disabled persons with a more or less constant flow of real income as long as they live. Insurance companies sell similar products (annuities) and profit from their large portfolios and knowledge of the distribution of longevity in the communities served. As with private annuities, no equity is accumulated by social security programs that can be passed on to the next generation. Most public pension programs are pay as you go systems, and in contrast to private annuity programs, tend not to be profit centers for national governments. Rather, they are subsidized in various ways. For example, most low income persons receive a "discount" on their annuities, even after adjusting for longevity differences between low income and high income persons. The subsidies are largely financed by the higher premiums (taxes) paid by high income persons.

As true of other social insurance programs, public pension programs are never so generous nor their subsidies so great that public pensions entirely replace private pensions. Rather, the result is normally a mixed system in which public pensions provide a base (which normally varies with income) and private pensions and savings are used to top up that base. Marginal retirement dollars are privately controlled. Private pensions are themselves often encouraged through a variety of tax preferences, but in this section we focus on the public pension component of social security programs.

As in other areas of public choice, the politics of publicly provided or subsidized pensions begins with an analysis of the economic effects of those programs. How do the affect the welfare of person receiving the benefits and paying the taxes? And, what effects do the programs have on national savings and labor participation rates? Such effects will

affect voter demands for publicly provided or subsidized pension, regardless of whether voter interests are narrow or broad. Among the economic analyses of the U. S. social security program, Feldstein's (1974, 1995) research is probably the best known. Feldstein (1974) argued that the substitution effect of social security program reduces personal savings and its wealth effect induces earlier retirement. Labor participation rates fall rapidly after the age requirements to receive social security are satisfied.

The public choice literature attempts to explain why particular public pension benefit levels are adopted and why they change through time. Many of the purely economic explanations are apolitical in that they take program parameters to be predetermined and use relatively simple mechanistic demographic trends to explain aggregate expenditure levels. By contrast, the public choice literature uses political models—various combinations of electoral, interest group, and social contract theories—to characterize the political demand for social security.

Pioneering theoretical work on the electoral basis of social security was done by Browning (1973, 1975), who used an overlapping-generations model to explain the size of the program. Browning notes that the median voter with respect to social security is a person of approximately median age and income. Such a voter is older than half of the electorate, which tends to be older than much more than the population as a whole. Because much of the cost of the program is a sunk cost for the median voter, she supports a much larger social security levels than a young person would, although a smaller program than persons of retirement age would have demanded. As long as rates of return are positive for the median aged voter, the program will remain in place, even if rates of return for younger persons are negative.

Browning's analysis has been refined in various ways, but remains the main conceptual framework for electoral models of social security programs. For example, Sjoblom's (1985) critique of the Browning model uses his overlapping generation framework to demonstrate that the steady state assumed by Browning may not be credible and so may not be as dynamically sustainable as Browning argues. Sjoblom argues that sustainability may require that the program be constitutionalized in some way. Sjoblom's analysis may account for the stability of much of the general architecture of the programs (tax structure, base, and conditionality of benefits), which remains stable for decades at time. The Browning model has also been extended in various ways as, for example by Boadway and Wildasin (1989), who note that initial benefit levels tend to exceed those of the long run steady state.

The median voter approach was not, however, subjected to empirical tests until 1990. Congleton and Shughart (1990) tested the relative explanatory power of median voter, special interest group, and combined models of social security benefit levels using U. S. data. Their median voter model implied that benefit levels reflected the fiscal constraints of the median voter, such as labor income, private pension income, age (life expectancy and remaining work life), real interest rate, growth rate, effective tax base per elderly, the number of retirement benefit recipients, their private pension income, and the size of social security administrative expenditure. Their estimates of that model verified that changes in the median voter's fiscal constraints tended to

cause changes in social security retirement benefit levels. Similar models were subsequently developed by Nishimura and Zhang (1992), Zhang (1995), Breyer and Craig (1997), and Tabellini (2000) and tested on international (OECD) data sets.

The main alternative to the electoral explanation of social security benefit levels are models that focus on the efforts of politically active interest groups. In interest group models, politically active groups representing elderly voters lobby for and obtain these programs as a transfer from younger generations. An early instance of the interest group model of the determination of social security benefits was sketched out by Olson (1965). The number of the individual beneficiaries is much smaller than the number of the individual contributors who pay the social security taxes while working. However, the former gain more from an expansion in benefits than a single taxpayers pays, which gives retired (and nearly retired) persons a stronger incentive to become involved in the politics of social security benefit level than the persons paying the taxes. Olson's analysis was fleshed out by Weaver (1982) in a book length analysis and has been used in many subsequent papers.

The organization of politically active groups is rarely modeled, but the models implicitly assume that "formeteurs" or "political entrepreneurs" create formal organizations of one kind or another that solve the various free-riding and coordination problems of political action. Once organized, formeteurs may encourage single issue voting, conditional contributions to campaigns, providing elected representatives with information about the breadth of support for such programs, and the writing of books and editorials. Such organizations may also encourage their members and the public at large to vote against candidates proposing public pension decreases and in favor of those proposing increases.

In addition to "outside" interest group models, "inside" interest group models can also be applied. For example, Niskanan's model of bureaucratic behavior could also be applied to persons working in social security administration(s). Senior social security bureaucrats tend to be an "inside" interest group insofar as they all have an interest in the growth of social security program. As social security expenditures increase, employment opportunities increase, and senior managers will have somewhat greater discretionary power and non-pecuniary benefits. Persons who think that social security is normatively an important policy area will also tend to be attracted to senior positions in social security programs. Thus, for combinations of narrow and broad self-interests, senior bureaucrats will be inclined to testify and lobby in favor of expanded social security programs.

Congleton and Shughart (1990) develop an interest group model of social security benefit levels that includes both inside and outsider groups and test the model using U. S. data. Similar international studies emerged in the late 1990s and early 2000s.

In addition to the pure electoral and interest group models of public policy formation, there are also models and empirical studies that combine aspects of several models. In such models, social security programs reflect both electoral pressures and the efforts of special interest groups. In an early test of such models, Congleton and Shughart

II (1990) provide evidence that a combined model does a somewhat better job of explaining the path of social security benefits in the U. S. than either a pure electoral (median voter) or pure interest group model, although the median voter model outperforms the pure special interest group model. Kim (2010) updates the Congleton and Shughart II (1990) model by including later data, using somewhat more sophisticated econometric techniques, and taking account of subsequent changes in social security programs (the Greenspan commission reforms). His results are broadly similar to those in the Congleton-Shughart study. He finds that a combined model does the best job of explaining social security benefits in the United States. In addition, he finds evidence that the reforms of the Greenspan commission (which can be regarded as a quasi-constitutional amendment to the program) affected the growth path of average social security benefits. His results also suggest that interest groups may be becoming more important determinants of benefit levels.

Galasso and Profeta (2002) provide a useful survey the international literature on public pension programs (social security). The international literature is largely consistent with the U. S. studies. The international research suggests that the growth rate of economy, real interest rates, inflation, and deadweight cost all have effects on program size and growth. In addition, redistributive incentives analogous to those worked out by Usher (1977), and Meltzer and Richard (1981). Several studies have found that the ratio of mean-to-median income, the skewness of the income distribution, and average income affect social security expenditures. They also report that the proportion of elderly is also positively related to the size of social security as a share of GDP, but not with respect to benefit levels per retired persons. The latter suggests that the constitutionalization of the social security programs (that is their stable age-dependent eligibility criteria) may be more important than the interest group effects of organizations of retired persons.

Overall, the public choice literature on national social security programs implies that the expenditures for public pensions is a joint consequence of day-to-day politics and relatively stable eligibility requirements for the programs.

B. Research on the Political Economy of Subsidized Medicine

Another major insurance program of the welfare state covers or subsidizes health care coverage. As true of public pension programs, many of these programs are quite old, with roots in the late nineteenth and early twentieth centuries. These programs have historically been smaller than public pension programs, but have gradually become (or are becoming) the largest of the welfare state programs. The direct subsidization of health insurance and/or services is normally combined with a variety direct and indirect health care tax preferences and subsidies. However, these are neglected in this section of the paper in order to focus on the government provided health care insurance and/or services.

In a manner similar to public pension programs, the nature and growth of these programs reflect day-to-day politics and longer term quasi-constitutional decisions. In the short run, the extent of public support and breadth of coverage can be varied day-to-day or year-to-year. The range of medical procedures supported can also be adjusted at the margin in various ways. Are experimental treatments, dental services, mental health services, health spas, and/or plastic surgery to be supported by the government programs, and if so, to what degree? Insurance can be complete, that is medical services entirely paid for by taxpayer finance programs, or obtaining some or all medical services may require significant copayments. In the long run, basic parameters of the public support for healthcare can be adjusted. The delivery method (subsidy, mandate, or provision) and the financing of the programs can be adjusted. Healthcare and/or health insurance can be subsidized, health insurance can be mandated, healthcare can be provided directly by state enterprises, and various combinations of these policies may be adopted. Once adopted, however, the general architecture of the healthcare system tends to be stable for decades at a time.

In most welfare state, the result is a mixed public-private system in which a public base (safety net) can be topped up with purchases of supplemental private insurance or direct private purchase of healthcare services (Besley and Gouveia, 1994). The private-public mix varies widely, as indicated by figure 2.

Expenditures on tax-payer supported medicine is a joint consequence of long and short run policy choices, demographics, and the technology of healthcare. Economic and political decisions affect policy decisions in a manner analogous to those of social security programs. There is a tax price for such programs and the benefits tend to be disproportionately received by relatively old persons (roughly the same persons that receive public pensions). Longevity and average age of the populations served thus have effects on the demand for government subsidies for healthcare insurance and direct provision. Demographic trends in the West tend to increase both health care costs and public (median voter) support for government support of healthcare, other things being equal. Costs also tend to increase as the range of health care services that can be provided increases, which largely reflects technological advance in the healthcare area.

It bears noting these demographic change and technological advance are also partly consequences of policy choices. Increased longevity may be partly a consequence of public health care choices (see figure 2), and technological advance may be partly a consequence of direct and indirect government support for healthcare insurance and medical R&D.

There is more variety among healthcare systems in the West than there is among public pension programs. System choice also tends to affect health care costs, although it is not completely obvious how or why. This section addresses the choice of healthcare system and the next addresses how public policies, especially those subsidizing medical R&D, have affected the cost of medical procedures. As in the case of public pensions, a variety of tax preferences often encourage the provision and purchase of private health insurance, but we focus on the politics of direct public subsidies and production of healthcare services in this and the next section of this chapter.

As in the case of the political economy literature on public pensions, the political economy literature on health care begins with models of the private demand for and effects of public healthcare policies, because these determine voter net benefits from programs that support healthcare. Classic work on the economics of health care is that of Arrow (1973) and Pauly (1974). Arrow's analysis suggests that competitive markets tend not to generate Pareto efficient levels of health care and medical insurance for a variety of reasons including: externalities (contagious diseases), defects in property rights systems, and economies of scale. He also analyzes information problems and barriers to entry that affect markets for healthcare services and insurance. Pauly (1974) analyzes consequences the asymmetric information problems that produce moral hazard. Insured parties will tend to under invest in preventative care when insurance companies cannot perfectly assess or price the risks for specific insurance purchasers. He shows that over, rather than under, insurance is a likely consequence of this type of informational asymmetry, although high risk customers may be underserved. All these problems imply that the private provision of health care is unlikely to be Pareto optimal. Pauly suggests that many the shortcomings of the healthcare market can be overcome by imposing compulsory limits on the purchase of health insurance and/or by making information about a person's total insurance purchases available to all insurers.[3] The Arrow and Pauly analyses provide the main analytical frameworks for subsequent work on the politics of public health care systems, although their theories were revised, extended, and tested in various ways.

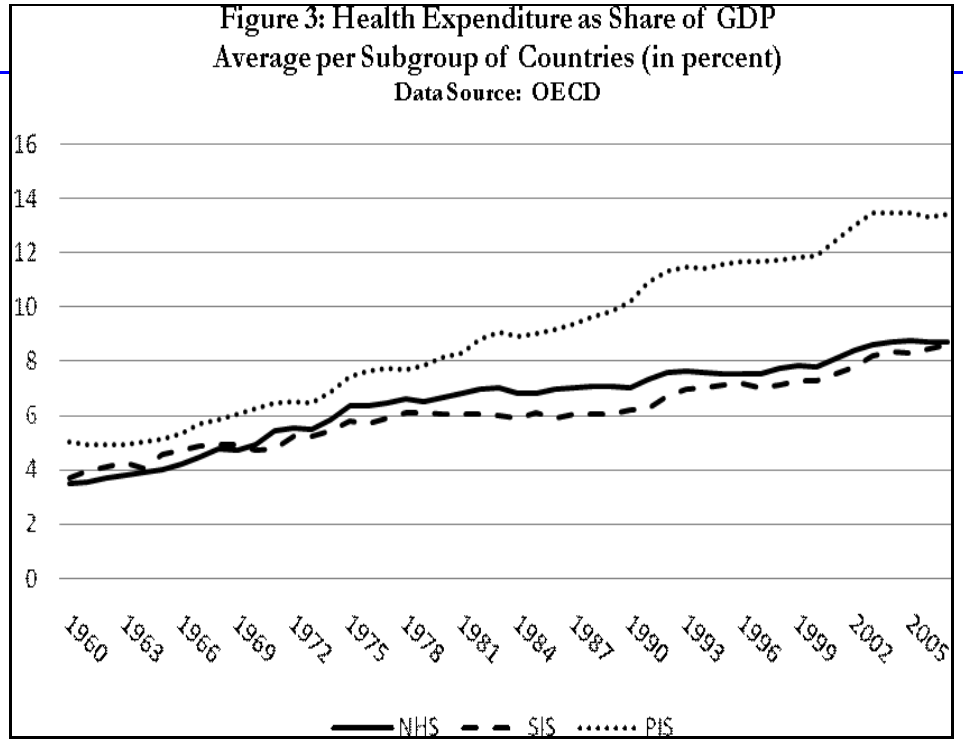
Pauly (1974, 1988) also initiates the public choice analysis of public health care provision by analyzing a simple short run median voter model of public insurance mandates and subsidies. Congleton and Shughart (1990) test related models by suggesting that the demand for many healthcare programs can be modeled in a manner similar to that of social security, because they benefit retired persons more than working persons. Their estimates of U. S. of combined social security and medicare benefit levels were similar to their estimates of social security (public pensions) alone. The early approaches, however, did not model healthcare programs that were not conditioned on age or indirectly targeted at retired persons. Analysis of day-to-day political support for health care support levels continued through the nineties, as with Vogel (1999).

Another important subsequent strand of the public choice literature on healthcare focuses on the long-run quasi-constitutional choice of health care systems. Healthcare systems vary substantially among OECD members and the choice healthcare systems evidently has significant effects on the average quality of healthcare services and, perhaps surprisingly, on their costs. Figure 3 illustrates the average cost of the three main healthcare delivery-payment systems. Social insurance systems (SIS) have historically cost less than national health care systems (NHS) which, surprisingly, have historically cost less than

[3] Grossman (1972) provides a useful economic model of heath in which a person's health is a capital good that depreciates with age. Investments in healthcare can (partly) offset the associated depreciation of health capital. Hall and Jones (2007) analyze the income elasticity of the demand for health care.

private insurance systems (PIS) in OECD countries. (Most of the observed systems are mixed systems that include elements of the others, but systems are classified by the largest of their component parts.)

Early analyses of system-level choices focused on pure private, pure public, and mixed systems, without accounting for differences in public systems. For example, Breyer (1995) focuses on the manner in which health care services may be provided. He assumes that the benefit level of a state-provided health insurance plan is voted on in a referendum and that the social insurance plan is funded by a flat income tax. Voters are distinguished by income and taste over consumption of health care. This model is applied to two settings: one in which no greater quantity of health care can be consumed than that adopted by the national insurance plan, the other in which additional insurance or health care can be bought privately, as is true of most public healthcare systems. In both settings, the public insurance level is assumed to be driven by the median-voter. The political equilibrium in the second case produces a dual private-public regime of health care provision, with the tax level depending on the distribution of income and tastes across the population. In the second setting, people with greater than average income and marginal utility of healthcare tend to "top up" with privately-provided health care. Gouveia (1997) develops a similar analysis of referenda on healthcare support levels, but includes consideration of different health risks (morbidity). This general line of research continues through Jacob and Lundin (2005) and Pietrantonio (2010).



The Pietrantonio (2010) analyses includes an unusually broader range of alternative financing structures and choice of various pure and mixed systems of private, insurance mandates, and public provision. He finds that political equilibria exist for the three major public health care systems: ones that are mostly private (PIS), ones that are mostly driven by insurance mandates (SIS), and ones in which health care services are largely publicly financed or produced (NHS). His analysis implies that both income and morbidity affect political decisions about which health systems to adopt. Private insurance tends to be adopted in countries where the risk of getting sick is relatively low and the income distribution is relatively unequal, whereas social-insurance is adopted where the risk of getting sick is relatively high and the income distribution is relatively more uniform. National health system tends to be adopted in the intermediate cases.

C. The Political Economy of Subsidized Medicine Technology

National expenditures on healthcare also vary with the range of procedures that are covered by the private and public insurance and/or provided by private and government healthcare centers. The menu of possible procedures is substantially an effect of past technological innovation. When health care program were first established they were relatively small in large part because relatively little true healthcare could be provided by the medical sector. That technological advances are important determinants of healthcare costs has long been recognized. For example, the importance of technology is noted by Arrow (1962) and Tullock (1995), among many others. Essentially all surveys of the literature on healthcare expenditures note the importance technological change in explaining healthcare expenditures, as for example in Besley and Gouveia (1994) and in Folland et. al (2009). Indeed, it can be argued that if public and private insurance have a significant long run effect on aggregate medical expenditures, it is likely to be through expanded coverage of procedures and consequent increases in rates of technological innovation in health care.

Not all technological innovations in health care increase costs, but many do so by bringing new more labor and capital intensive procedures to the menu of available remedies. Whether cost increasing technologies are more likely than cost reducing ones is not self-evident. However, it seems clear that average medical costs have been rising faster than in other parts of the economy and has been doing so at least partly because of technological advances have raised rather than reduced costs and public and private insurance coverage have been expanded to pay for the new more expensive techniques.

Without increases in the available techniques for treating illnesses, the demand for health insurance would grow more or less at the rate of other insurance, which grows at roughly the same rate as income. But, average health insurance expenditures have increased at a much faster rate than per capita national income. Between 1960 and 2010, healthcare expenditures in the U. S. tripled as a fraction of GDP, rising from around 5 percent of GDP to more than 16 percent.

Technological progress is not, of course, an entirely random event. It is drive to a large extent by R&D expenditures. A significant fraction of medical research is paid for directly with tax dollars and much of the rest is indirectly subsidized through tax preferences. For example, Dorsey et. al (2010) reports that out of approximately hundred billion dollars of expenditures on biomedical research in the US in 2007, thirty seven billion dollars of it was financed by federal, state, and local governments (taxes), with NIH accounting for about seventy percent of those expenditures. Moreover, without the expansion of insurance coverage, there would be little private research on more elaborate and expensive medical equipment and techniques.

On this point Weisbrod (1991) argues (pp.539-540) that the introduction of more cost effective procedures, i.e. the shift from retrospective payments system to prospective payment systems favors the discovery and adoption of drugs that substitute for surgical methods more than the discovery of drugs that are complements to surgical methods. Baker (1997, 2001) shows how the introduction of HMO practices slowed down the process of adoption of new

Given the importance of medical innovation for health care costs, surprisingly little research has taken place on the political economy of subsidies for medical technologies. This may be partly because the direct expenditure levels are relatively small and difficult to assess directly. They are also somewhat more difficult to model, because of all the various interconnections between long-run demand, supply, and innovation rates.

As a first approximation, political support for medial R&D is analogous to that for public pensions and healthcare subsidies. The benefits from medical research tends to be age dependent, because most persons demand (need) sophisticated medical procedures only after they reach retirement age. Moreover, medical innovations take substantial time and so (intergenerational) public support for R&D is less affected by the stability problems noted by Sjoblom (1985). Consequently, informed voters of approximately median age and income are likely to be decisive in determining NIH and other government medical research subsidies.

However, unlike social security, the typical voter will have very little direct information about the level and allocation of their governments' health care R&D expenditures or their ultimate effects. So, there is unusually large scope for interest group interventions of various kinds, including organized groups representing elderly interests, the health care industry, various non-profit disease lobbies, and academic researchers. A good deal of the allocation of resources takes place in Congress, which assigns budgets to the various specialized disease institutes.

Within the private sector, the probability of successful innovation, expected rate of utilization, and anticipated degree of monopoly power (patents) will be important factors for R&D investments (Weisbrod 1991, Weisbrod and LaMay 1999). Within the public sector, median voter expectations and the efforts of for-profit and non-profit interest groups are likely to be significant determinants. Electoral pressures push research dollars toward investigations of diseases that affect large portions of the population, such as cancer and heart disease. Lobbying dollars, in contrast as with private R&D), will tend to support research in areas where innovations patentable and few substitutes exist (anticipated monopoly profits). In neither case, will R&D subsidies attempt to minimize the expected losses from disease. Fortunately, such losses tend to be correlated with the size of the beneficiary groups (electoral support) and the absence of readily available substitutes. Consistent with the electoral analysis, the three largest appropriations account for about half of NIH expenditures: NCI (National Cancer

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technologies. Today's research (especially on the part of private companies) will be then influenced by at least four factors: i) by the expected supply of rival technology that will be available at the time of introduction of the new technology; ii) by the expected institutions and practices that will govern the supply of health care (especially the public one) at the time the new technology will be available; iii) by the influence that the supplier of the new technology will exert in order to introduce it in insurance plans' coverage (both public and private); iv) by the rate of diffusion that the particular technology will have in the market.

Institute), NIAID (National Institute of Allergy and Infectious Diseases), and NHLBI (National Heart, Lung, and Blood Institute).[5]

For the purposes of the rest of this chapter, the electoral support for public subsidies for health-care R&D is modeled as a demand for insurance. That is to say, new technologies are expected to reduce the risk (losses) from diseases in much the same manner that other insurance does. As true of the demand for both public pensions and ordinary health care insurance, voter support for health-related R&D subsidies will vary with income and age. The success of R&D efforts, in turn, affects the demand for health insurance, per se, as new procedures become available in the future. Future research is likely to model the mix of R&D subsidies adopted and estimate the extent to which both the level and allocation of those subsidies is electorally and/or interest group driven.

III. Modeling a Voter's Demand for Social Insurance

Congleton and Bose (2010) develop a model of the demand for income security that extends the narrow self interest voter models used in previous public choice research on the various programs of the welfare state to include effects of ideology and institutions. They argue that voter demand for social insurance is affected by personal risks, income, and insurance costs; and also by a voter's ideological (or other normative) interest for particular insurance programs. Although Meltzer and Richard's like effects are implied by their model, is is not a model of redistribution from one group of voters to another, but rather of the demand for broadly inclusive social insurance programs. Given voter demands, the support levels adopted depend on the political institutions under which policy choices are made. The next few pages provide an overview of their approach and model.

Suppose that an age-dependent random "shock" strikes people and reduces their ability to work and play. Such shocks include debilitating diseases, accidents of various kinds, technological shocks that affect the value of one's human and physical capital, and business cycles that reduce one's employment opportunities. A tractable model of the effect of such shocks can be created by assuming that all such shocks affect a typical voter's effective work and leisure hours and that only two states of "endurance" are possible.[6] When "well" (in the absence of the shock), a typical person (referred to as Alle) has H hours to allocate between work, W, and leisure, L. When "not well" (when affected by the shock), Alle has $S < H$ hours to allocate between work and leisure.

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[5] See the *Summary of the Presidents FY 2011 Budget:* http://officeofbudget.od.nih.gov/pdfs/FY11/Summary%20of%20the%20FY%202011%20Presidents%20Budget.pdf. See also the NSF data tables for R&D. http://www.nsf.gov/statistics/nsf07332/content.cfm?pub_id=3798&id=2

[6] The results from a two-state model are very similar to those generated by models with a bounded continuum of shocks on work and leisure opportunities. Very similar results, for example, can be generated from a model that characterizes health states with a uniform probability distribution.

Work produces private good Y, which is desired for its own sake, with $Y_i = \omega W_i$, where ω is the marginal and average product of labor. The probability of being affected by a negative shock is age dependent, with $P=p(A)$ for a person of age A. In addition to economic interests, a person's interest in social insurance is affected by internalized normative theories of various kinds.[7] The norms of greatest interest are ideological and philosophical theories that characterize the ideal level of social insurance—possibly ones associated with theories of "the good society" or implied by theories of "social welfare."

The typical voter, Alle, is assumed to maximize a strictly concave Von-Neumann Morgenstern utility function defined over private consumption, Y, leisure, L, and the extent to which the actual social insurance, I, departs from his or her ideological ideal, I^{**}, as with $U = u(Y_i, L_i, |I-I_i^{**}|)$. To simplify the analysis, a person's ideology does not affect his or her demand for income and leisure, $U_{YI} = U_{LI} = 0$, although it may affect his or her demand for social insurance.

In the absence of an income insurance program, Alle maximizes:

$$U^{woH} = u(\omega W_i, H - W_i, |I-I_i^{**}|) \quad (1)$$

when well and maximizes:

$$U^{woS} = u(\omega W_i, S - W_i, |I-I_i^{**}|) \quad (2)$$

when she is not well. In either case, her work day (or work week) will satisfy similar first order conditions:

$$U^T_Y \omega - U^T_L = 0 \quad (3)$$

Alle's workday sets the marginal utility of the income produced by her (or his) work equal to the marginal cost of that work in terms of the reduced utility from leisure.

The implicit function theorem implies that Alle's work day (supply of labor) can be characterized as:

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[7] Only a few public choice–based studies have explored the effects of norms on voter behavior, although norms and civic duty have long been part of rational-choice explanations of voter turnout. Linbeck (1997a, 1997b) develops a theory of the welfare state that includes a role for norms. See Eichenberger and Oberholzer-Gee (1998) or Congleton (2007b) for applications within a rational choice models of politics. Rational choice models that analyze the economic effects of norms include Congleton (1991b) and Buchanan and Yoon (2000). Early rational choice models of the political effects of ideological theories held by voters were developed by Congleton (1991a) and Hinich and Munger (1994).

Several electoral turnout studies also stress the importance of norms. Jackman's (1987) study demonstrates that institutional differences and closeness affect turnout at the margin, but suggest that cultural differences are larger determinants of average turnout. (The Swiss and U.S. dummy variables, and the unexplained constant term are relatively large in his estimates.) Aldrich (1993) provides an overview of rational choice theories of turnout that take account of civic duty. Plutzer (2002) provides evidence that propensities to vote are affected by families and peer groups, which are likely mechanisms for the transmission of norms.

$$W_i^* = w(T, \omega, I, I_i^{**}) \quad (4)$$

In general, Alle's work day varies with her active hours ($T = H$ *or* S), marginal product (wage rate), current institutions, and vision of the good society. Alle's income falls from $\omega w(H, \omega, I, I_i^{**})$ to $\omega w(S, \omega, I, I_i^{**})$ when affected by the random shock.

Having characterized W_i^* in a setting without social insurance, consider the effects of a government-sponsored program that collects a fraction of the output produced by each taxpayer-resident through earmarked proportional taxes, t, and returns it to "unwell" residents through conditional insurance demogrants, I. This program provides a "safety net" (insurance payout) of I units of the private consumption good Y for persons who are less able to work (in state S). Given that program, Alle's net income is $Y^H = (1\text{-}t)\ \omega_i\ W^H$ when she is fully able to work, and $Y^S = (1\text{-}t)\ \omega_i\ W^S + I$, when she is less able to work.

Naturally, such a program changes Alle's behavior because it changes the net rewards of working when well and when not well. Given the program, Alle now maximizes:

$$U^H = U(\ (1\text{-}t)\ \omega_i\ W, H - W, |I\text{-}I_i^{**}|) \quad (5)$$

when well and

$$U^S = U(\ (1\text{-}t)\ \omega_i\ W + I, S - W, |I\text{-}I_i^{**}|) \quad (6)$$

when unwell. Taking the derivative with respect to Alle's work period (W) characterizes the first-order conditions that characterize Alle's work day (or work week) during well and unwell work periods. These are again similar to each other.

$$U^T_Y\ (1\text{-}t)\ \omega_i - U^T_L = 0 \quad (7)$$

Equation 7 differs from equation 3 in that Alle again equates the marginal utility of net income produced by working (which now includes effects from taxes and the government's income-security guarantee) to the marginal opportunity cost of time spent working.

The implicit function describing Alle's work day is now:

$$W_i^* = w(T, \omega, I, I_i^{**}, t) \quad (8)$$

Equation 8 is the same as equation 4 if the taxes and benefits equal zero. T again represents the time to be allocated, which is determined by the individual's state of health or work opportunities. (I does not appear because it is determined by the fiscal constraints, the tax rate, risk factors, wage rate, and size of the community.) Partial derivatives of equation 8 imply that Alle again works more when she is well than not well, but generally works less when she is covered by a social insurance program than when she is not. Strict concavity of the utility function allows these derivatives to be signed unambiguously.

For most day-to-day purposes, the parameters of a government-sponsored social insurance program are exogenous variables for the individuals who take advantage of them. The exception

occurs on Election day, when the parameters of the program are indirectly controlled by voters. Elected representatives are induced by competitive pressures to pay close attention to the preferences of voters both before and after that day if they want to hold office. On those days, both fiscal constraints and the voter's ideology tend to be important.

The Congleton-Bose characterization of the typical voter's utility function assumes that each voter has a conception of the good society that includes a "normatively ideal" safety net, which is represented as I_i^{**}. The voter's ideological dissatisfaction with current social insurance levels is, consequently, an increasing function of $|I-I_i^{**}|$ where I is the existing program. Alle's preferred public safety net, I_i^{*}, as opposed to her normatively ideal one, I_i^{**}, varies with both her own circumstances and ideology, and the fiscal circumstances of the government that sponsors the service.

The actual benefit level, I, is assumed to be determined by a combination of electoral pressures, fiscal realities, and political institutions. If there are N members in the community eligible for the program of interest, $\Sigma p(A_i)$ qualify for benefits during a typical work period. For symmetric age-conditioned probability distributions, this can be written as $P^A N$, where P^A is the average probability of being unwell in the community of interest. The tax base is $\Sigma\, \omega_i\, W^T_j$, where $T = H$ or S depending on whether voter-taxpayer i is in state H or S. For symmetric distributions of age conditioned probabilities and propensities to work, the tax base can be written as $\omega^A W^A N$, where ω^A is the average wage and W^A is the average work period.

The tax revenues are earmarked for the public safety net program(s), so the income guarantee is $I = (t\Sigma\, \omega_i\, W^T_j)\,/P^A N = (t\, \omega^A W^A N)/P^A N = (t\, \omega^A W^A)/P^A$. In general, both the average tax base and number of persons drawing benefits varies with the age distribution and nature of relevant health and economic shocks, which are assumed to be fixed for the period of analysis.

A bit of substitution, calculus, and the implicit function theorem implies that a typical voter's preferred government-provided safety net can be characterized as a function of the parameters of his or her (i's)optimization problem:

$$I_i^{*} = g(\omega_i,\ A_i,\ I_i^{**},\ P^A,\ \omega^A,\ N,\ S,\ H) \qquad (9)$$

The typical voter's demand for social insurance varies with his or her wage rage and age (which determines his or her probability of being affected by the income-reducing shock), the lost hours associated with being "not well," and his or her ideological welfare norm. For fiscal reasons, it is also affected by the number of taxpayers and the average probability of being subject to the income reducing shock, S, and average wage rates, ω^A. The extended utility function also implies that a voter's preferred government-provided safety net is somewhere between that of a "rational choice pragmatist," who chooses benefit level I to advance his or her own economic interest, and that of a political idealist, who uses public policies to advance his or her vision of the good society.

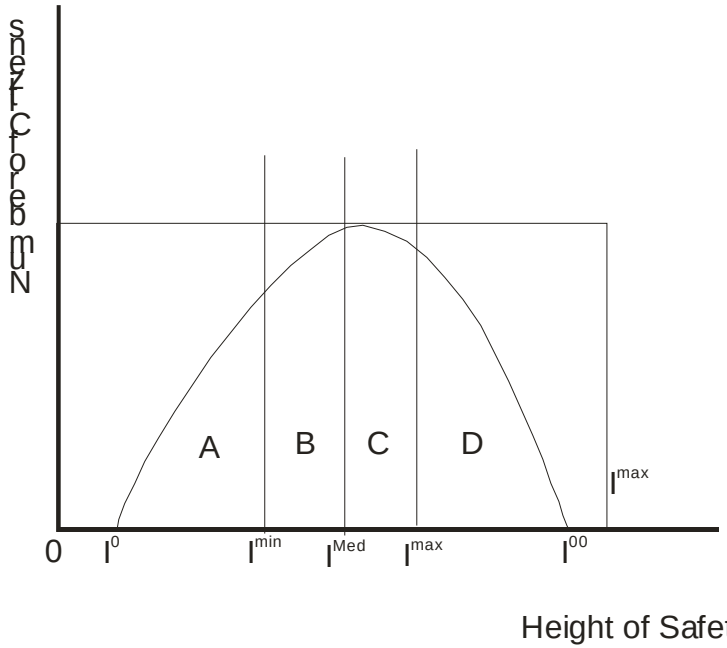
Unfortunately, the signs of the partial derivatives of equation 9 cannot be determined without making additional assumptions, although conventional economic intuitions and a good deal of evidence suggest that more social insurance tends to be demanded as income and personal risks (age) increase, and as risk aversion and the ideological norm for social insurance increase. For most voters, tradeoffs exist between personal net receipts that are (partly) generated by effects on the size of the tax base similar to those in Meltzer and Richard's (1981) analysis (although in this case the "transfer" is received only when the person qualifies for it), and also tradeoffs generated by personal ideological goals. Tradeoffs also exist between a voter's financial self interest and normative or ideological goals, because very few voters will regard the present benefit level to be normatively ideal.

This voter model can be used to characterize a wide variety of electoral based political equilibria and changes in those equilibria will cause social insurance benefits to change. However, this is not always as straightforward as one might expect, because political institutions affect how changes in voter policy demands affect policy outcomes.

Under direct democracy, the frequency distribution of voter-preferred income security programs associated with given distribution of utility functions, wages, ages, and norms determines the identity of the median voter (if one exists). Given a one dimensional policy space, such as occurs above given the fiscal assumptions, choosing a public safety net using majority rule implies that the median voter's ideal program tends to be adopted, I^{med}, and that changes in the program after the median voter's ideal program is adopted reflect changes in her demand for income security. The median voter's demand for the social safety net can be characterized by substituting values for median wage rates and ideology into equation 9. The model developed above implies that the median voter's preferred social safety net changes if the median wage rate, age, or social insurance norms change.

The model also implies that if median income is below average income, a risk-neutral median voter's preferred safety net is somewhat *above her ideological ideal*, because she or he tends to be a (subsidized) net beneficiary of the tax-financed insurance program. If there is a widely accepted ideal level of social insurance in the community of interest, I^{**}, the actual policy under direct democracy tends to be a bit more than that ideal level, because of the median voter's subsidized price for social insurance.

Figure 4
Distribution of Citizen
Ideal Safety Net Levels



Under more complex collective decision procedures, the political equilibrium is affected by both the starting point of program negotiations and the particular collective decisionmaking procedures in place.

As an illustration, consider a series of small increases evaluated by a two-thirds supermajority rule with 0 as the initial point of departure. This procedure yields safety net I^{min} in figure 4, where area A is twice as large as area B. I^{min} is smaller than that preferred by the median voter, because more than a third of the voters oppose further increases. The same voting rule will produce an income security program that is larger than that desired by the median voter if the status quo ante is initially above the median citizen's ideal and incremental reductions are voted on. The policy chosen in that case will be I^{max}, where area D is twice as large as area C.

Note that the same logic implies that shifts in I^{min} and I^{max} *tend to produce asymmetric shifts in policy*. For example, if the polity of interest is at I^{min}, for example, and I^{min} decreases because of changes in voter income or preferences, *only a minority will favor decreasing the social safety net from its previous value* and the safety net program will not be changed. On the other hand, if I^{min} increases, a supermajority would favor increasing I from its previous value. Statistically, such asymmetric policy adjustments will show up as auto-correlation. That is to say, autocorrelation is a predicted consequence of super majority procedures, rather than an extraneous statistical nuisance if the voter model describing shifts in I^{min} is essentially correct.

Although no Western governments explicitly use supermajority rule to make policy decisions regarding the height of the public safety net, several widely-used institutions have similar effects on policy outcomes. For example, systems of government with bicameral legislatures have two veto players. Representatives in each body are selected by somewhat differing electorates, and because of differences in district sizes, voter-turnout, and the timing of elections, tend to represent somewhat different interests. If elected representatives cast their votes in government in a manner consistent with the interests of

their respective median voters, these more complex architectures increase the effective size of the majorities required to pass laws within a given legislature.

These supermajority-like effects imply that both income increases and ideological shifts to the left (increases in the ideologically ideal level of the safety net, *I***) tend to induce smaller changes in the government-sponsored safety net in countries with bicameral parliaments than in those with unitary ones, and somewhat different final outcomes. Policy adjustments tend to be smaller on average and asymmetric in countries with more veto players, insofar as veto-player interests differ and the effect is analogous to super majority rule.

Congleton and Bose (2010) provide a series of estimates of their ideologically and institutionally augmented model of the size of social insurance programs in OECD countries. These are consistent with their analysis. Welfare state programs tend to expand with average age, income, and as ideology drifted to the left. They tends to decrease (or increase less) as the number of veto players in a nation's political institutions increased.

They conclude that the modern welfare state rose, because voter income increased and because ideological norms shifted in directions that favored larger social insurance programs. The growth of social insurance programs in specific countries was also affected by the political institutions under which program reforms were adopted, with less expansion of the welfare state taking place in countries with more political veto players. Although their aggregate estimates did not include medical R&D expenditures, similar effects are likely to exist for health-care R&D subsidies, which have been increasing through time as income and median age increase.

IV. Electoral Politics, Interest Groups and the Modern Welfare State

Analysts of democratic politics have long argued that democracies may engage in wholesale redistribution that undermines their viability. Among the first, were case studies developed by Aristotle in around 330 BCE. The major programs of the welfare state, however, are not pure transfer schemes in the sense of taking money or property from one group and giving it directly to another. Instead, various insurance programs are adopted (and subsidized) that take money from the well to

Such implicit requirement for supermajorities was first noted by Buchanan and Tullock (1962). More formally, G_{min} is the solution to $\int^{+}_{Gmin} f(G) = 100 - \phi$, where f(G) is the distribution of voter ideal points implied by equation 15, given the existing distribution of ideologies and wages, and ϕ is the implied supermajority requirement for the political institutions of interest. Similarly, G_{max} is the solution to $\int^{Gmax}_{-} f(G) = 100 - \phi$. Note that Gmax = Gmin when ϕ = 50%. Contemporary democracies often differ in the number of veto players and their manner of election (Tsebelis 2002, Congleton and Swedenborg 2006).

provide health care expenditures to the sick and income for the unemployed and disabled. The same "transfers" may be said to exist under both private and public insurance programs, as for example a fire insurance program may be said to transfer wealth from persons without fires to those with homes damaged by fires.

The logic and models of insurance, however, are quite different than those for unconditional transfers for several reasons. First, no altruism or ideological impulse is necessary to explain a demand for insurance. Second, such programs tend not to affect average income although they may affect the variance of income (neglected moral hazard and adverse selection effects). Third, there are settings in which such insurance can be more efficiently provided by government than in the private sector—although it is easy to exaggerate those arguments.

That democracies tend to subsidize social insurance, rather than engage in wholesale redistribution helps to make them more viable than they would otherwise be. For example, cycling problems and instability problems tend to be smaller, especially when the fiscal arrangements are quasi-constitutional. However, that does not imply that social insurance programs are without risks for democracies. The early social-welfare programs were relatively modest in size and remained so until after World War II, as noted above. After World War II, many of these programs expanded rapidly as insurance benefits levels were increased and more persons became eligible for benefits.

The path of average benefits rose far too quickly after WWII to be accounted for by demographics and technological advance alone. One possible explanation was that more and more transfers were being adopted and contemporary democracies were on an unsustainable slippery slope to bankruptcy, instability, and constitutional collapse. Another possibility focused on by most of the public choice literature was that electoral support for such programs had simply increased after the war was over and that the programs were simply reflecting a series of new electoral equilibria.

The programs were adjusted at a variety of margins many times during the twentieth century, but there was an especially rapid expenditures between 1960 and 1985. To account for these changes a richer model of the politics of social insurance and true transfer programs was proposed by Congleton and Bose (2010), who suggest that many of the shifts in policy can be explained by including the effects of ideological norms and institutions. Their focus on aggregate spending rates do not explicitly account for changes in the mix of expenditures such as the increased importance of healthcare expenditures, but did a reasonably well at explaining the great expansion between 1960 and 1985 and the subsequent slower expansion rates during the next two decades. (A slippery slope theory would have a difficult time explaining the slower growth of that period.)

Other changes, such as shifts in the relative strength of interest groups, could also be taken into account. Interested and organized groups include retired persons and others very likely to benefit directly from public pension, health insurance and health-care R&D programs. The latter include members of the various social service bureaucracies, supporting NGOs, academic researchers, and private producers of medical and non-medical services for elderly persons.

The normative implications of the institutionally and ideological electoral models are not entirely clear unless one applies relatively

simple majoritarian norms such is "whatever the majority decides is correct." Many of the early theoretical pieces suggest that social insurance tends to be over supplied relative to levels that maximize GDP or social welfare. If pivotal voters have below average income, they tends to demand more than their own normatively "ideal" level of social insurance.

The institutional analysis and empirical results of Congleton and Bose (2010) suggest that such biases may be overcome or at least moderated with institutional design. Their analytical results imply that the safety net produced by political institutions with more veto players tend to be less "democratic" in the sense that they are less connected to the demands of the median or average voter. However, insofar as election-based polities with many veto players in the post war period tended to provide less social insurance than those with fewer veto players, the welfare states produced by such polities may be closer to the mainstream "normative ideal" (I**) than the median voter's preferred policy would have been.

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