

Public Choice and the Modern Welfare State, On the Growth of Government in the Twentieth Century

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Abstract

In the 25-year period between 1960 and 1985, social insurance and transfer programs expanded greatly in all Western countries. The fraction of GDP accounted for by government expenditures approximately doubled in much of Europe and grew by 40% to 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 summarizes 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 suggests that ideas as well as conventional economic interests also played a role in the twentieth century expansion of the welfare state.

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I. Introduction

The welfare state is roughly as old as Western democracy. In much of Europe, various national social insurance programs were adopted at about the same time that broadly elected parliaments began to dominate policy formation. Germany's social security program began in 1889, Sweden's in 1909, and the United Kingdom's in 1911. These early programs usually were adopted by conservative or liberal coalitions and so, initially, could be said to be "liberal" in their general structure and benefit levels.⁶ The social security programs of the United States and Switzerland were adopted somewhat later, in 1935 and 1947, respectively, but also had support from both right-of-center and left-of-center liberals at their inception.

The adoption of national insurance programs was also associated with industrialization and its associated business cycles, which often swamped (bankrupted) the traditional sources of social insurance. In the years before the national income security programs were in place, income insurance had been provided by families, private organizations (such friendly societies, churches, and other private clubs), and by local governments. Congleton (2007a) suggests that an efficient demand-side risk-pooling model can explain many durable features of early national social insurance programs. A "liberal" welfare state reflects personal demands for income insurance and economic advantages associated with national provision of income security relative to supply through available private income insurance clubs and firms.

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. A social insurance rationale for both small and large welfare states is also broadly consistent with empirical

⁶ The term "liberal" is used in its older European sense. 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.

evidence developed by Tanzi and Schuknecht (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.⁷ 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.”

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. If the welfare state is a “nanny” state with a relatively high “safety net” with very broad coverage, it emerged after World War II. Between 1950 and 1980, social insurance programs increased dramatically. They rose 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. Similar programs in the United States rose from 5% of GDP in 1960 to 11% in 1980.

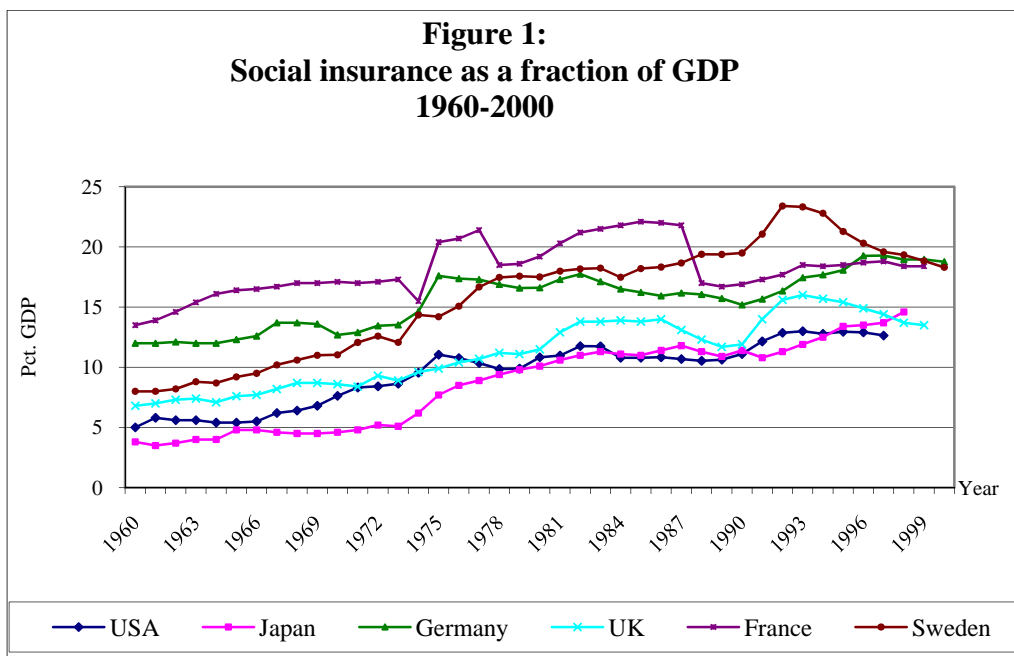
The timing of the rapid expansion of those programs after World War II is more difficult to explain than their initial creation during or shortly after times of economic crisis.

The modern welfare state evidently reflects more than an increase in the private demand for social insurance. 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 expansion in government-provided income insurance, as argued by Hall and Jones (2007). However, unless social insurance is a luxury good, its income elasticity should be closer to one than to three. The doubling and tripling in the sizes of these programs during the 1960s and 1970s relative to GDP requires much greater income elasticity than that associated with private insurance.⁸ In the early postwar years, changes in perceived risks are also likely to have played a role. Subjective assessments of

⁷ Private demands for insurance, whether publicly or privately provided, tend to have a small effect on the distribution of national income, because they moderate variations in income due to exogenous economic and health shocks, rather than redistribute income from rich to poor. Unemployment insurance and health insurance tend to shift money to those who are unfortunate, rather than from rich to poor per se. Nonetheless, social insurance reduces the extent to which bad luck reduces personal income and wealth, and thereby also reduces income and wealth variance.

⁸ See, for example, Mantis and Farmer (1968) or Gruber and Poterba (1994) for estimates of private insurance demand. Both report positive coefficients for income that are consistent with a less-than unitary income elasticity for the demand for insurance.

income and health risks are likely to have increased during the Great Depression and World War II. In many OECD countries, this increase in demand could be not expressed until after the war 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.



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. By the late 1960s, one would have expected perceived risks to have stabilized or been reduced by peace and prosperity. This downward trend in risk assessments would have been partly 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. However, the median age of the electorate was falling during the first part of the great expansion of welfare state programs as the “baby boomer” cohort reached voting age.

Additional factors evidently were important. Congleton and Bose (2010) suggest that the rise of the modern welfare state occurred in large part because of ideological and institutional changes that took place after World War II. In general, ideology shifted in a leftward direction, especially in the period between 1960 and 1980, 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. A summary of their analysis is provided towards the end of this chapter.

The first part of this chapter reviews public choice explanations of the emergence and growth of the major component parts of welfare state. It begins with an overview of public choice research on public pensions (social security) and follows with a survey of research on the politics of government support for healthcare. It then presents a synopsis of the approach used by Congleton and Bose (2010) to analyze aggregate government expenditures on social insurance and related income-security programs.

It bears keeping in mind that the growth of the welfare state is an important historical phenomenon and an important contemporary policy issue. Public choice theory should be able to account for the broad trajectory of social insurance expenditures if it provides an accurate model of public policy formation. The papers surveyed in this chapter suggest that public choice models of day-to-day politics can provide useful insight into the causes, conditional nature, and average levels of welfare state benefits. With respect to long term budgetary problems, the proper level of analysis may have to shift from day-to-day politics to quasi-constitutional models. To find a balance between promised benefits and public finances, some of the most durable features of our social insurance programs may have to be revised—if bankruptcy is to be avoided in the long run.

II. 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 financed largely by the higher premiums (taxes) paid by high income persons.

As is 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 by most taxpayers. 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 these affect the welfare of persons receiving the benefits and paying the taxes? And, what effects do the programs have on national savings and labor participation rates? Such effects will shape voters' demands for publicly provided or subsidized pensions, 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 – because of voting age restrictions – tends to be older 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 level 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 claims. Sjoblom argues that sustainability may require that the program be constitutionalized in some way. Sjoblom's constitutional conjecture may account for the stability of much of the general architecture of the programs (tax structure, base, and conditionality of benefits), which endures for decades at time. The Browning model has also been extended 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 individual beneficiaries is much smaller than the number of individual contributors who pay the social security taxes while working.

However, the former gain more from an expansion in benefits than a single taxpayer 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 "formateurs" or "political entrepreneurs" create formal organizations of one kind or another that solve the various free-riding and coordination problems of political action.⁹ Once organized, formateurs 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, Niskanen'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 personal stakes 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 program expansion.

Congleton and Shughart (1990) develop an interest group model of social security benefit levels that includes both insider and outsider groups and test the model using U.S. data. Their interest group model explained about the same amount of the variation of U. S. social security benefit levels as their pure electoral model. Similar international studies emerged in the late 1990s and early 2000s, as pointed out above.

⁹ Congleton (2011) develops and applies the notion of a formateur: The individuals or groups that found an organization he calls 'formateurs' and the persons recruited by formateurs he refers to as 'team members.'" (p. 28)

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 (1990) provide evidence that a combined model does a somewhat better job of explaining the path of U.S. social security benefits than either a pure electoral (median voter) or pure interest group model, although the median voter model somewhat outperforms the pure special interest group model. Kim (2010) updates the Congleton and Shughart (1990) analysis 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 presents evidence that the reforms proposed by the 1983 Greenspan commission (which can be regarded as quasi-constitutional amendments 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.

The international literature is largely consistent with the U.S. studies. The international research suggests that the growth rate of the economy, real interest rates, inflation, and deadweight cost all have effects on program size and growth. In addition, Galasso and Profeta (2002) suggest that redistributive incentives analogous to those worked out by Usher (1977), and Meltzer and Richard (1981) have affected social security benefit levels. 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. Galasso and Profeta report that the proportion of elderly is positively related to the size of social security as a share of GDP, but not with respect to benefit levels per retired person. 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 are jointly determined by day-to-day politics, given relatively stable fiscal systems and eligibility requirements.

III. Research on the Political Economy of Subsidized Medicine

Another major insurance program of the welfare state covers or subsidizes health care coverage. As is 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's programs. The direct subsidization of health insurance and/or services is normally combined with a variety of 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 healthcare 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 taxpayers, 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.

Expenditures on tax-payer supported medicine is a joint consequence of long and short run policy choices, demographics, and the technology of healthcare. In most welfare states, 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 public-private mix and efficacy of healthcare systems vary widely, as indicated by Figure 2, which plots the fraction of total health care spending by the public sector against average longevity at age 65. There is more variety among healthcare systems in the West than there

is among public pension programs.

Figure 2: Public to Total Health Expenditure vs. Life Expectancy at 65



Data Source: OECD

Economic and political factors 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 who 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 healthcare 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 that demographic change and technological advance are also partly the consequences of policy choices. Greater longevity may be partly a consequence of public healthcare 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. 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 healthcare begins with models of the private demand for and effects of public healthcare policies, because these determine voter net benefits from such programs. Classic work on the economics of healthcare is that of Arrow (1963) and Pauly (1974). Arrow's analysis suggests that competitive markets tend not to generate Pareto efficient levels of healthcare 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 of 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 of 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.¹⁰ 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.

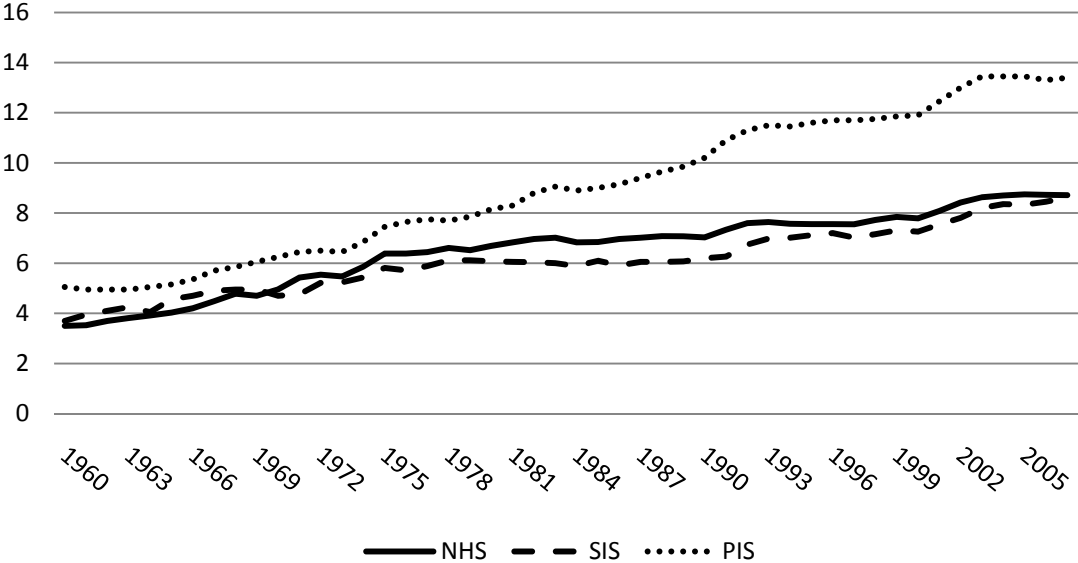
Pauly (1974, 1988) also initiates the public choice analysis of public health care provision by analyzing a simple short run median voter model of public insurance mandates and subsidies. Congleton and Shughart (1990) test related models by suggesting that the demand for many healthcare programs can be modeled in a manner similar to that of social security, because they tend

¹⁰ Grossman (1972) provides a useful economic model of health 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.

to benefit retired persons more than working persons. Their estimates of combined U.S. 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 healthcare benefits 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 healthcare systems. Healthcare systems vary substantially among OECD members and the choice of 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 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.)

Figure 3: Health Expenditure as Share of GDP
Average per Subgroup of Countries (in percent)
 Data Source: OECD



Early analyses of system-level choices concentrated 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 healthcare 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 healthcare. This model is applied to two settings: one in which no greater quantity of healthcare 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 healthcare 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 referendums 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 (2011).

The Pietrantonio (2011) analyses includes an unusually broad 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 financed or produced publicly (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.

IV. The Political Economy of Subsidized Medical 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 healthcare programs 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 (1963) and Tullock (1995), among many others. Essentially all surveys of the literature on healthcare expenditures note the significance of 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 coverage of new procedures, drugs, and devices, and consequent increases in rates of technological innovation in health care.

Not all technological innovations in healthcare 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 have been doing so at least partly because 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 expand 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 United States 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 driven 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 subsidized indirectly through tax preferences. Dorsey et al. (2010) reports that out of approximately \$100 billion of U.S. expenditures on biomedical research in 2007, \$37 billion was financed by federal, state, and local governments (taxes), with the National Institutes of Health (NIH) accounting for about 70 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.¹¹

Given the importance of medical innovation for healthcare 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 medical R&D can be modeled in a manner similar to that for public pensions and healthcare subsidies. The benefits from medical research tend to be age dependent, because most persons demand 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 public pensions and medical insurance programs, the typical voter will have very little direct information about the level and allocation of their governments' healthcare R&D expenditures or their ultimate effects. So, there is unusually large scope for interest group interventions of various kinds, including organized groups representing the elderly, 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

¹¹ On this point, Weisbrod (1991, pp. 539-540) argues 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 surgery. Baker (1997, 2001) shows how the introduction of HMO practices slowed down the process of adoption of new 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 healthcare (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.

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. Private dollars, in contrast, will tend to support research in areas where innovations are patentable and few substitutes exist, because these increase 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 are to diseases that affect a broad swath of elderly persons. These appropriations account for about half of NIH expenditures: NCI (National Cancer Institute), NIAID (National Institute of Allergy and Infectious Diseases), and NHLBI (National Heart, Lung, and Blood Institute).¹²

This suggests that the electoral support for public subsidies for healthcare R&D can be modeled as a demand for subsidized social 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 is true of the demand for both public pensions and ordinary health care insurance, voter support for health-related R&D subsidies is likely to 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.

V. Modeling a Voter's Demand for Social Insurance

Congleton and Bose (2010) develop a model of the demand for income security that extends the narrowly self-interested voter models used in previous public choice research on the various

¹² 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.

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-like effects are implied by their model, it 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.¹³ 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.

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.¹⁴ The

¹³ 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.

¹⁴ 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 model 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 suggests that cultural differences are larger determinants of average turnout. (The Swiss and U.S. dummy variables, and the unexplained

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:

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

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-

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.

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 $Y^H = (1-t) \omega_i W^H$ when she is fully able to work, and $Y^S = (1-t) \omega_i W^S + I$, 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:

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

when well and

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

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 periods. These are again similar to each other.

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

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, $\sum p(A_i)$ 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 $\sum \omega_i W_i^T$, 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 $I = (t \sum \omega_i W_i^T) / P^A N = (t \omega^A W^A N) / P^A N = (t \omega^A W^A) / P^A$. 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:

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

The typical voter's demand for social insurance varies with his or her wage rate 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 exist as well 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.

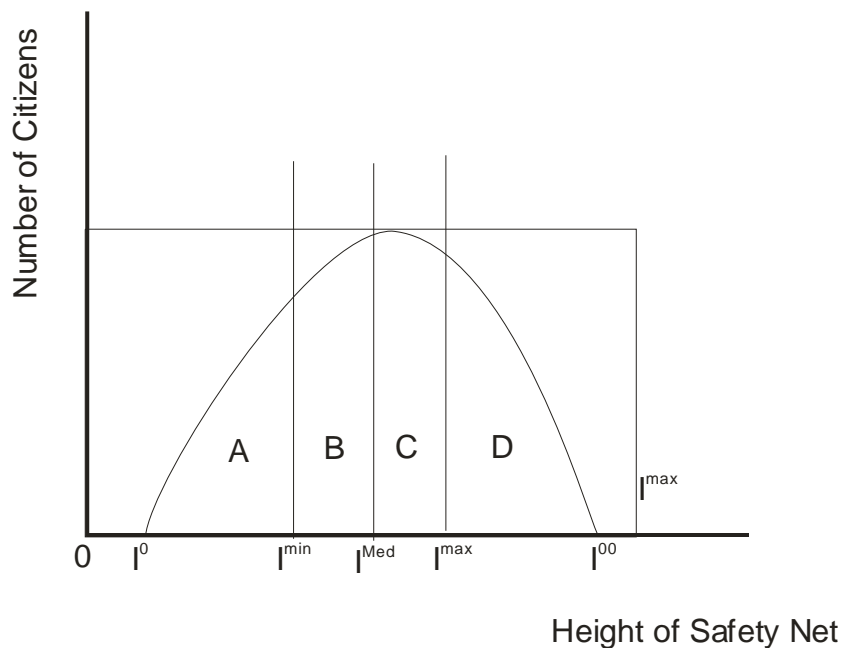
This voter model can be used to characterize a wide variety of electoral based political equilibria and changes in those equilibria will cause social insurance benefits to change. However, this is not always as straightforward as one might expect, because political institutions affect how changes in 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 under those 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 lowering 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 autocorrelation. That is to say, autocorrelation is a predicted consequence of super majority procedures, rather than an extraneous statistical nuisance if the super majority voter model describing shifts in I^{min} is essentially correct.

Although no Western government explicitly uses 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 legislative votes 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.¹⁵

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

¹⁵ Such implicit requirement for supermajorities was first noted by Buchanan and Tullock (1962). More formally, G_{min} is the solution to $\int_{G_{min}}^+ f(G) = 100 - \phi$, 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 $\int_{-}^{G_{max}} f(G) = 100 - \phi$. Note that $G_{max} = G_{min}$ when $\phi = 50\%$. Contemporary democracies often differ in the number of veto players and their manner of elections (Tsebelis 2002; Congleton and Swedenborg 2006).

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 OLS and GLS estimates of their ideologically and institutionally augmented model of the size of social insurance programs in OECD countries based on the Huber et al. (2004) data set. These are consistent with their analysis. Welfare state programs tend to expand with average age, income, and as ideology drifted to the left. They tend to decrease (or increase less) as a nation's political institutions include more veto players.

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 veto players. Although their aggregate estimates did not include medical R&D expenditures, similar effects are likely to exist for healthcare R&D subsidies, which have been increasing through time as income and median age increase.

VI. 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 analyses of this possibility, were case studies developed by Aristotle circa 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 provide healthcare subsidies for the sick and income for the unemployed, elderly, 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.

Models of social insurance differ from those for unconditional transfers in several respects. First, no altruism, ideological impulse, or conspiracy is necessary to explain the existence of programs that provide benefits to a minority of voters. Second, insurance programs do not necessarily affect average income, although they may affect the variance of income (neglecting 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. Such settings may account for modest social insurance programs based on majority voter interests, who act without fear of revolutionary threat or substantial altruism. That democracies tend to subsidize social insurance, rather than engage in wholesale redistribution, may also reduce problems associated with majority decision making. 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 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 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.

However, there was an especially rapid increase in expenditures between 1960 and 1985. To account for such rapid increases in welfare state programs evidently requires a richer model of the politics of social insurance. Such a model was proposed by Congleton and Bose (2010), who suggest that the unusually rapid growth of social insurance programs in that period can be accounted for by including the effects of ideological norms and the institutions of collective choice. Their analysis of aggregate spending rates did not explicitly account for changes in the mix of expenditures such as the increased importance of healthcare expenditures, but it did 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 affecting the relative strength of interest groups could also be taken into account. A variety of groups benefit directly from public pension, health insurance, and healthcare R&D programs. The latter include retired persons, members of the various social service

bureaucracies, supporting NGOs, and commercial and academic producers of medical and non-medical services for elderly persons.

The normative implications of public choice models of the welfare state are not entirely clear unless one applies relatively simple majoritarian norms such as “whatever the majority decides is correct.” Many of the early theoretical pieces suggest that social insurance tends to be oversupplied relative to levels that maximize GDP or social welfare. Indeed, Congleton and Bose (2010) note that if pivotal voters have below average income, they tend to demand more than their own normatively “ideal” level of social insurance.

If the welfare state tends to be larger than it should be, the institutional analysis and empirical results of Congleton and Bose suggest that such a bias can be reduced with institutional design. Their analytical results imply that the safety nets 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 tend to provide less social insurance than those with fewer veto players, the welfare states produced by day-to-day politics in 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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