RECENT DEVELOPMENTS IN AND FUTURE PROSPECTS FOR PUBLIC ECONOMICS

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Abstract

This paper describes several of the most important research advances in public economics during the last three decades. These include an improved theoretical understanding of the incentive problems in tax design, an expanded base of knowledge on how taxes and social insurance programs affect household and firm behavior, and a heightened recognition of the political economy of tax and expenditure policy design. The paper closes with several suggestions for promising directions for future research in the field of public economics.

Public economics is the study of the government's role in the economy. Because that role is constantly changing, public economics is a constantly-evolving field. Some of the field's core questions, such as how the tax rates on different goods should be set, transcend generations, while others, such as how best to reform the aging Social Security systems in many developed nations, have recently emerged as central topics. New insights from theoretical and empirical advances in many other sub-fields of economics help to inform the long-standing issues in public economics. In turn, the emerging issues within the field often provide the stimulus for new theoretical and applied research.

The last few decades have been a period of very rapid advance in public economics. Important new theoretical and empirical discoveries have substantially advanced our understanding of core issues such as the efficiency and incidence of various taxes, and on the economic effects and optimal design of social insurance programs. There has been substantial progress in both the economic theory that relates to public economics, and in the empirical analysis that supports detailed policy evaluations.

Different parts of public economics have advanced at different rates in the last three decades. In the early 1970s, the major research advances involved the application of economic theory to the second-best problems of tax design. In the late 1970s and 1980s, the advent of household-level and firm-level databases permitted new exploration of how tax incentives and other factors affected the behavior of economic agents. This ushered in a period of rapid growth in empirical public economics, and many applied econometricians turned their interests to public finance issues. The 1990s were marked by rapid expansion in positive political economy and related fields.

The increasing sophistication of much of the applied research within public economics has led to the creation of several sub-specialties within the field, such as the "economics of aging" and the "economics of school finance." The ongoing work in these fields is concerned with issues that are broadly within the purview of public economics, but that also draw upon insights and methodologies that have been developed in other sub-fields, such as health economics, demography, and labor economics.

This short paper summarizes some of the key advances in public economics during the last few decades and sketches several areas that seem well positioned for substantial research progress in the near future. Some of the past advances have been

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the direct result of progress in other sub-fields of economics, such as the econometric analysis of panel data on households and firms. Some has been the result of new research stimulated by emerging issues in the public sector. One of the most important skills that researchers in the field of public economics must master is spotting topics that are likely to become important issues of public policy, and on which economic analysis can provide important insights, *before* they have attracted substantial policy attention. In this way, researchers can help to provide an economic framework for subsequent policy discussions.

1. Important Advances in Public Economics—The Last Three Decades

This section describes several topics on which there has been substantial research progress during the last three decades. Many other topics have witnessed at least as much progress, and they are omitted only in the interest of space. This summary is probably tilted toward advances in empirical work, since I am most familiar with that strand of research. I have chosen to discuss a few topics in some detail because that provides an opportunity to explain the evolving nature of public economics research.[1]

The Effect of Income Taxation on Household Behavior

Since the mid-1970s, three forces have combined to dramatically advance our understanding of how income taxation affects the behavior of taxpayers. The first is the increased availability of public use data sets that provide information on household behaviors such as labor supply, saving, and charitable giving that may be affected by taxation. These data sets include the Current Population Survey, the Survey of Consumer Finances, the Panel Survey of Income Dynamics, and the Statistics of Income Individual Income Tax Model files.

The second force is the rapid advance of econometric methods for the analysis of both cross-sectional and panel data on household behavior. Many of the early applications of new econometric methods focused on the analysis of how taxes and social insurance programs affect household labor supply and other behaviors. This was true of panel data methods in the 1970s and 1980s, as well as of nonparametric methods in the 1990s.

The third factor is the presence of several tax reforms during the 1980s and 1990s that generate substantial variation in the marginal tax rates facing many households. The Economic Recovery Tax Act of 1981 reduced marginal tax rates for most households, and the Tax Reform Act of 1986 provided even sharper rate reductions for those at the top of the income distribution. Some of the changes that were enacted in the 1986 act were reversed in 1993, when the Omnibus Budget and Reconciliation Act raised marginal tax rates for high-income households. For some types of income, notably capital gains income, the Taxpayer Relief Act of 1997 provided a substantial change in marginal tax rates. The most recent tax reform, the Economic Growth and Tax Relief Reconciliation Act of 2001, promises still further substantial changes in the marginal tax rates facing households.

The combined effect of these tax changes was a set of substantial changes in marginal tax rates, with a very erratic time series pattern. The weighted average marginal income tax rate on dividend income, for example, fell by almost twenty percentage points between 1980 and 1990, but then rose by several percentage points during the first half of the 1990s. The average tax rate on wages fell by more than eight percentage points during the 1980s, and then rose again in the 1990s. The tax rate on realized capital gains nearly doubled between 1985 and the mid-1990s, but then declined in the late 1990s. These tax changes have provided a wealth of opportunity for public finance researchers to investigate how taxation affects household behavior.

What have we learned? First, there is much evidence that taxpayers take advantage of short-term reallocations of income or financial assets that will substantially reduce their tax liability. The surge in capital gains realizations around the Tax Reform Act of 1986 testifies to this sensitivity, as does the retiming of income receipts in late 1992 and early 1993, when increases in top marginal income tax rates were widely expected. In general, it appears that reported taxable income is quite sensitive to the marginal tax rates that households face, particularly for households at the top of the income distribution.

Second, there is a growing body of research suggesting that behaviors such as hours of work and labor force participation are sensitive to marginal tax rates. Evidence on the response of secondary earners to marginal tax rate reductions in the Tax Reform Act of 1986, and on the response of lower-income households to changes in the incentives embodied in the Earned Income Tax Credit, is particularly revealing in this regard.

Third, we have learned that it is essential to adopt a comprehensive view in analyzing tax incentives, and not just to focus on the incentives in a particular part of the tax system. Both the estate tax and the individual income tax appear to affect the level of lifetime charitable giving as well as the division of charitable giving between lifetime gifts and charitable bequests. The corporate income tax and the individual income tax interact to determine the mix of income between subchapter S and subchapter C corporations, and the behavior of entrepreneurs who may consider incorporating their labor market activities.

In spite of these advances, much remains to be done. For example, there is little consensus on how sensitive the labor supply of primary earners is with respect to the after-tax wage, or on how the level of such labor supply might change after the general equilibrium effects of a major tax reform were fully recognized. Hours of work are only one dimension of labor supply for such workers, and it is not clear whether there is substantial elasticity on other margins, such as the difficulty of the job or the need for business travel. There is also a growing recognition that many aspects of household behavior may be affected not just by current tax rates but also by past and expected future tax rates, although few empirical studies have incorporated this insight.

The Incentive Effects of Social Insurance Programs

The availability of household-level data sets beginning in the mid-1970s made it possible for public finance researchers to study the effect of social insurance programs such as unemployment insurance (UI), workers compensation, Medicaid, and Social Security on household behavior. Nearly three decades of research has now yielded a convincing body of evidence on how these programs affect labor supply, retirement, job search, the utilization of medical care, and a range of other behaviors.

Researchers have exploited many different sources of variation in program rules and the availability of social insurance benefits. Some research uses cross-national differences in programs. Recent studies of how labor supply rates of older men are related to Social Security and disability programs show much higher rates of labor force withdrawal in countries that offer generous program benefits to workers who are no longer in the labor force than in countries without such benefits. Other research uses cross-state differences in program rules. There are many studies based on administrative record data for the U.S. states that explore how the availability of unemployment insurance benefits affects the duration of unemployment spells. These studies generally find substantial effects of changes both in benefit generosity and in the length of time that benefits are available on the length of unemployment spells. Still other studies have used detailed aspects of program variation within states or other administrative jurisdictions. The Medicaid program, for example, was substantially expanded in the 1980s and 1990s, but the expansions were targeted to particular types of households, and in some cases to children of particular ages. Researchers have compared the use of medical care by, and the labor supply behavior of, households with children of very similar ages but with different eligibility status because of the arbitrary nature of age-cutoffs in program eligibility. The results show that access to Medicaid not only affects health care utilization, but also changes the labor supply behavior of the eligible households.

The analysis of social insurance programs and household behavior has offered a rich base for the application of new econometric tools that have been developed for "program evaluation." The most refined research in this spirit has devoted careful attention to the question of why policies in some states changed, while policies in other states remained the same, and it has tried to identify genuinely exogenous shocks to the policy environment. Such shocks provide the best opportunity to learn about the link between program characteristics and household behavior.

The now substantial body of research demonstrating that social insurance programs affect household behavior has begun to affect the way policymakers view program design. There is growing recognition that behavioral changes may affect the cost of program changes, and a realization that behavioral distortions associated with these programs may have substantial efficiency effects.

The Efficiency and Incidence of Taxes on Capital Income

The economic analysis of taxes on capital income, and particularly corporate capital income, has been one of the most active research areas in public economics for the last few decades. This is also an area where one can identify a clear link between research findings and public policy. My discussion will focus on four distinct advances.

The first major advance was the use of computable general equilibrium models, along with careful analysis of the institutional structure of the corporate income tax, to evaluate the cost of capital and the "effective tax rate" for range of different capital assets. In the late 1970s, inflation combined with a nominal tax code that provided depreciation allowances based on the historical cost of acquiring assets to substantially raise the tax burden on corporate capital income. This was an important factor behind the enactment of the Economic Recovery Tax Act (ERTA) of 1981, which provided accelerated depreciation for many asset types. After ERTA, the effective tax burdens on different assets varied quite substantially. Documenting this, and quantifying the potential efficiency costs from large differences in the effective tax rates on different assets, was one of the major research accomplishments of the early 1980s. This research featured prominently in the policy debate leading up to the Tax Reform Act of 1986, which "leveled the playing field" across different assets.

A second important development in the analysis of capital income taxation was the introduction of the asset price approach to tax incidence. Prior to the early 1980s, most discussions of the incidence of the corporate income tax were carried out in the context of multisector models that assumed that capital could flow freely between different uses, while the total supply of capital was fixed. The asset price approach, in contrast, recognized the short-run inability to reallocate capital from one use to another. The accumulated capital assets that are deployed in residential real estate cannot be easily transformed to industrial plant and equipment when the tax burden on those assets declines. Raising the tax burden on one class of assets, and lowering it on another, will therefore lead to changes in the market price of existing assets. These price changes will in turn provide signals for new investment to flow to sectors in which the after-tax return is highest. The insights of the asset price approach called attention to the difference between tax burdens on new capital and the tax burdens on old capital, and underscored how the asset price changes associated with tax reforms could affect the distributional effects of these reforms.

A third development in recent decades, linked to research advances in corporate finance, has been the recognition that the average tax burden on corporations, as well as the marginal tax burdens on new projects, may affect investment incentives. Previous research stressed the role of the cost of capital as the channel linking tax parameters to the incentives for undertaking new investment. More recent research has also recognized that factors that affect the return on existing assets, and thereby the cash flow that firms have available for investment, may also affect the flow of new investment. This research has led to a better understanding both of the differences between the internal and external capital markets facing corporations, and to a clearer evaluation of policy changes that might not affect marginal investment incentives but might affect total corporate tax burdens.

Finally, theoretical research has generated new insights on the optimal design of capital income taxes. Researchers have discovered that in infinite horizon models, the optimal steady-state capital tax rate is zero. To the extent that capital income taxes feature in the efficient tax program, it is therefore because they offer an opportunity for a "taking" from those who hold capital at the time when the tax is enacted—a tax on old capital, not on new investment. Of course, one-time levies on capital are difficult if not impossible to implement in practice, since governments face well-known problems of dynamic inconsistency. Even if *today's* government promises not to tax capital in the future, *tomorrow's* government may find it optimal to tax capital and thereby to renege on the earlier policy. The risk of such expropriation of some of the returns to capital discourages investment by those who are considering new long-term projects. The efficiency arguments against taxing capital income have been recognized as a partial counterweight to the arguments that some make, given the skewed nature of ownership of capital assets, for taxing capital income on equity grounds.

Deficits and Intertemporal Fiscal Policy

Richard Musgrave's classic 1959 text, *The Theory of Public Finance,* divided the study of public economics into three strands: one concerned with the allocation of economic resources, another concerned with the distribution of economic resources, and a third concerned with the stabilization of economic fluctuations. In recent years, however, much of the research on stabilization issues has shifted to macroeconomics and monetary economics, as public finance economists have concentrated on the analysis of the microeconomic effects of tax and expenditure programs. A notable exception to this statement involves the recent advances in methods for measuring deficits and defining the intergenerational consequences of fiscal policy.

One line of inquiry has drawn attention to the need for careful accounting to fully describe the impact of the government sector on the economy. The 1970s brought an awareness of how inflation affects reported budget magnitudes. The real value of nominal government debt shrinks during inflationary periods, making standard budget statistics quite misleading. The saving and loan crisis of the 1980s reminded policy makers and public economists that it is important to account for contingent liabilities when considering any measure of fiscal stance. Government insurance programs may commit future resources, and thereby tighten the government budget constraint, even though they do not have any immediate effect on reported budget statistics. There has similarly been progress in the recognition that governments own capital assets that may appreciate or depreciate over time.

The second line of advance with respect to analyzing the effects of budget rules in many ways is motivated by the limitations of standard budget statistics. It recognizes that the budget we observe in any single year is really just a part of a larger intertemporal fiscal program, which provides benefits to and levies taxes on many different cohorts of citizens. Documenting the net effect of the fiscal system on a lifetime basis is a major challenge, but one that has been tackled in a number of studies. Recent research has suggested that the "generational accounts" that arise from current fiscal rules may look very different for those who are old and those who are young. In particular, the need to finance large, on-going social insurance programs, such as Social Security and Medicare, place heavy fiscal burdens on the workers who will be in the labor force and paying taxes several decades in the future. This is not revealed by traditional budget measures, but it does reflect an important feature of current fiscal policy. "Supplemental" budget accounts, recognizing these factors, are now being prepared with increasing levels of detail regarding prospective fiscal policy.

Positive Political Economy Models of Fiscal Outcomes

One of the most active areas of recent research progress has been at the interface between formal political science and economics. Models of voter behavior and of the nature of equilibrium in political systems have been used to provide new insight on the types of tax and expenditure policies that may emerge in representative democracies, and on the potential impact of fiscal and political institutions on policy outcomes. This line of inquiry parallels a related research program in international trade, where the central question is what explains the nature of tariff policies chosen by different nations.

Within public economics, the link between a jurisdiction's fiscal constitution and its fiscal policy outcomes has attracted substantial attention. During the 1970s and 1980s, researchers explored the link between electoral institutions, such as the four-year cycle in presidential elections in the United States, and the nature of macroeconomic policy. This is the "political business cycle" literature. More recent work has shifted from an interest in cycles to a focus on how various political institutions and constitutional constraints may affect the budget deficits or surpluses of a jurisdiction. This was very relevant in the United States in the late 1980s, when there was active policy debate about a balanced budget amendment, and it may attract renewed attention in the coming decades.

More generally, there has been substantial interest in understanding how fiscal institutions affect budget outcomes. Researchers working in the tradition of the median voter model were poorly equipped to address questions about the potential effects of new fiscal rules that were designed to reduce the likelihood of budget deficits, since institutions play no role in that model. They were also unable to address questions like the possible bias toward deficit finance in some types of legislative systems. Yet important progress has been made on these questions by drawing upon recent advances in the formal analysis of voting and electoral choice. The result has been a substantial body of research on topics such as the effect of gubernatorial and presidential line-item veto power on the level and composition of spending, and the effect of parliamentary as opposed to presidential government, on the average level of budget deficits.

Optimal Income Taxation and the Design of Tax and Transfer Programs

A final dimension along which public economics has progressed in recent decades concerns the theory of optimal taxation and optimal policy design. Path-breaking theoretical work in the early 1970s provided a range of new insights on the economic analysis of distortions associated with income taxation. One of the critical insights of this research is the importance of "self selection constraints" in determining the structure of optimal tax and transfer policies. In designing a tax program, or an income or in-kind subsidy, government planners must recognize that some households who are not part of the notional target population may try to qualify for program benefits. Households that currently have jobs may decide to enter the pool of the unemployed if unemployment insurance benefits are sufficiently generous. Workers who have the potential to earn substantial amounts at high wages may decide to work less, and pay less in taxes while consuming more leisure, if marginal tax rates are high. The focus on ways to design transfer programs that will not be too attractive to households outside the target group has led to new insights. For example, we now recognize that it is at least possible that distributing aid in-kind rather than in cash, and making it somewhat difficult to apply for and receive particular transfer programs, may be part of the optimal transfer policy. This represents a substantial turn-about relative to the emphasis on negative income taxes and cash transfers in prior research.

A second important insight involves the link between consumer preferences and the structure of optimal income tax and optimal commodity tax rates. Early work on both income taxation and commodity taxation did not consider the interplay between the two taxes. Some researchers tried to characterize the vector of optimal commodity taxes, while others tried to describe the shape of the optimal income tax. Yet recent research suggests that the two are intimately connected. For many classes of consumer preferences, including the preferences that are associated with many utility functions that are popular for pedagogical purposes, if the government has access to an optimal nonlinear income tax, it will never choose to utilize commodity taxes. Moreover, there is a growing recognition that the detailed structure of optimal commodity taxes depends on information about the derivatives of compensated demands with respect to many different prices, and that this information may be impossible to estimate with any precision. This development has generated some doubt about the general usefulness of the optimal commodity tax framework, at least when efficiency considerations are the primary factor underlying the design of the taxes.

2. Promising Research Directions for the Future

The rising volume of research in public economics during the last few decades testifies to the research community's belief that there are widespread opportunities for interesting and informative study. Increased research activity notwithstanding, there are still many topics that offer promising avenues for future work. This section offers what is surely an idiosyncratic perspective on some of the issues that may represent the most fruitful directions for future work. Some are areas of long-standing research interest, where the returns to further work appear to be substantial. Others are emerging topics, where growing public policy attention suggests significant benefits from economic analysis.

Environmental Economics and Optimal Second-Best Policy

Growing interest in environmental policies, particularly in nations other than the United States, has raised many interesting public economics issues. Many of these topics were addressed during the wave of professional interest in environmental economics during the early 1970s, but warrant re-investigation using more recent advances both in applied economic theory and in empirical methods. The central issues include the measurement of environmental costs, is a precondition for designing optimal Pigouvian taxes, and the integration of Pigouvian taxes with other elements of the revenue structure. Proposals for carbon taxes that could collect substantial amounts of revenue led to an active public economics debate in the late 1990s on the subject of the "double dividend" associated with environmental taxes. This is the notion that by taxing pollutants, and thereby correcting the externality associated with these pollutants, a nation might raise enough revenue to be able to improve the efficiency of other aspects of its tax system, thereby generating a double increase in economic efficiency. The most careful research suggests that the double dividend is likely to be illusory, but further analysis is probably in order.

The pervasive nature of cross-border pollution concerns also makes environmental economics an interesting setting in which to develop models of intergovernmental policy competition and coordination. This is an issue with a long history in public economics: whether competition between governments leads to inefficiently low levels of taxes and public spending is an unresolved issue. Studying how environmental as well as tax policies are set in nations of different sizes, and with different degrees of crossborder spillovers in their policy benefits, should provide an wealth of opportunities to enrich what we know about intergovernmental interaction.

The Economics of Aging

The demographic shift that is already underway in the United States and many other developed nations has first-order implications for the public sector. In future years, there will be an increased need for spending on cash transfers to the elderly, as well as increased need for the provision of in-kind services such as medical care. The prospective revenue costs of such programs are so substantial that they may lead to changes in existing programs before the largest age groups reach retirement. The recent emergence of a policy debate in the United States on Social Security privatization testifies to the importance of evaluating the impact of population aging. Similar debates have emerged in many other developed and developing nations.

Public economics researchers have recently begun to study alternative options for ensuring an adequate supply of retirement resources when the largest cohorts leave the labor force. These include modifying the investment policies of government trust funds, changing the structure of current old-age benefit programs, and using new revenue sources, such as the income tax, to finance transfers to elderly households.

The research needs for developing a coherent analysis of policy choices in the face of population aging are daunting. They include the impact of population aging on the rate of economic growth, and consequently the growth of the government's revenue base, as well as on the prospective returns to various financial assets. Other issues center on how changes in policy parameters would affect household behavior. For example, the impact of the current Social Security and Medicare programs on retirement and saving behavior, and the potential impact of program reforms such as means-testing or raising the age of eligibility, is a topic of substantial interest both within economics and in policy circles. The goverment's role in regulating the pension system is another example of an issue that is likely to attract increased attention as a rising fraction of the population enters the age groups when pension payouts feature prominently in household income.

The next decade may be a golden age for research on the economics of aging. Databases that have only become available in the last few years, such as the Health and Retirement Survey and AHEAD survey, provide panel data on the elderly population. These surveys are far more detailed than most previous studies of this population group, so they hold the potential for a much richer analysis than previous policy analysts could conduct. They are particularly valuable because they offer some insight on the links between economic decisions, such as labor supply and wealth accumulation, health outcomes, and the availability of government programs.

"Privatization" and the Scope of Government

Around the globe, "privatization" has become one of the most discussed issues concerning the government sector. The former Soviet republics and many other nations in Eastern Europe have privatized what were once state-owned enterprises, while states and cities in the United States have sold assets and out-sourcing activities ranging from prison management to the collection of parking tickets. Understanding the consequences of such changes is critical. What rules should guide the government's role in the economy? The central issue is how one trades off the potential benefits of government intervention designed to correct market failures or affect the distribution of resources with the "government failures" associated with government involvement in various market activities. There are many aspects of economy activity where there is an active debate on the role of government as opposed to the private sector in providing goods and services. The provision of airport security services, currently a topic of active interest, is one example. Another is the role of vouchers or other methods of introducing competition in the provision of elementary and secondary education in the United States.

One very important area where the role of government is likely to be a continuing subject of debate, and where there are very promising opportunities for research in public economics, concerns health care. Health care costs have grown so rapidly in recent years, and the government's share of these costs is so substantial, that projections of current trends imply dire budgetary consequences in just a decade or two. While much of the research in health economics does not bear on public economics, focusing instead on the health production function and related issues, a great deal of health economics research does bear on issues involving the public sector. This is because a whole range of issues in government program design hinge on behavioral parameters such as the price elasticity of demand for medical care and the elasticity of nursing home supply with respect to Medicaid reimbursement rates. Some of the empirical work that is needed to measure this broad range of elasticities has been done, but far more remains to be done. Even more importantly, public sector analysts need a framework for analyzing the source of rapid health care cost growth. How much of the growth is due to technical progress, and how much of that is the result of government policies? Which policies are most important? Framing and answering these issues will help set the stage for a long-running national policy debate on the nature of government involvement in the health care and health insurance industries.

Important issues about the role of the government sector in the private economy arise in both developed and developing nations. Many of the most interesting applications are in Third World nations. The government's role in financial markets is one example. A number of studies have documented market failures in both credit and insurance markets in developing nations. Yet in some nations, government incentives have created credit cooperatives or risk-sharing pools that offer substantial benefits for the households that participate. Evaluating the net benefits of such government interventions is a substantial research priority.

Tax and Expenditure Policies in Open Economies

One of the notable trends of the last few decades is the increasing openness of the world economy. Transportation and communication costs have fallen, and the mobility of firms and factors of production seems to have increased. These developments suggest several new subjects for research in public economics.

One set of issues concerns the effects of tax policy on the behavior of multi-jurisdictional actors. This can involve trying to identify the effect of tax policy differences on location or financing choices of multinational firms, or the analysis of household mobility across national or state boundaries in response to tax or benefit differences. There is a small literature on optimal income taxation in the presence of international labor mobility. A larger literature explores the empirical evidence on Tiebout sorting and the degree of household mobility and specialization within jurisdictions. Whether it is possible to tax highly mobile capital at all is an open question, and one that some of the OECD's recent policy deliberations about tax havens underscore.

A second set of issues concerns the strategic interaction of jurisdictions in setting tax policy. If one country decides to become a tax haven, part of the revenue collected will come at the expense of other countries that have not chosen the tax haven route. Estimating the magnitude of such effects, the welfare effects of designing policies that might mitigate policy competition, and using the tools of game theory to model such strategic interactions, is a promising avenue for further work.

Optimal Social Insurance Program Design

The outpouring of empirical research on the effects of social insurance programs has run ahead of theoretical work establishing the principles of optimal program design. What are the central second-best considerations that need consideration? There is a need for further research designed to articulate the types of insurance that is provided by the wide range of existing programs, and to quantify the importance of such insurance. Some important research has begun to provide insight on how social insurance programs reduce the volatility of household consumption. Yet there is still relatively little discussion of the precise operation of private insurance markets, and of the nature of the market failures that create a case for government action. Because government insurance is rarely complete insurance for the various types of risks that households face, there is also an important question about the functioning of private insurance markets that insure the *residual* risk that remains after the insurance offered by government programs.

One aspect of social insurance program design concerns financing, particularly the role of mandated benefits in delivering insurance protection. Mandated benefits arise when a government requires other actors to provide or purchase a given set of insurance benefits. When governments face tight revenue constraints, requiring private firms to provide benefits, or requiring individuals to purchase certain types of insurance policies, often appears to be an attractive way of achieving policy objectives without spending government resources. These requirements may fall on sub-federal governments, or on firms, or on individuals. The economic analysis of mandated benefits is still at an early stage, in part because it is difficult to find credible sources of variation in mandate policy. The incidence of mandated benefits, and more generally the choice between such mandates and other methods of implementing social insurance program objectives, is a potentially fruitful avenue for further work.

Taxation and the Behavior of Households and Firms

Much has been learned in the last few decades about how households respond to tax incentives, and about how the tax system distorts the decisions of corporations. Yet this is such a central topic for public economics, and it is one where there is enough new information arriving over time, that it is both an area of great recent progress and an area where the future prospects are very bright. The research community has not yet had an opportunity to analyze any of the effects of the 1997 Taxpayer Relief Act on household behavior, and there are even more substantial tax changes in prospect as a result of the tax legislation that was enacted in 2001. Federal tax policy has shifted, and there are also substantial changes underway in state and local tax policy, thereby offering still further opportunities for exploring how taxes affect behavior.

The questions that require further attention include many "usual suspects." These include the effects of taxes on labor supply, the link between tax policy and saving behavior, and the effect of the tax treatment of housing, charitable giving, and state and local taxes on household behavior. There are also other questions that relate to emerging issues, such as the impact of the tax system on household insurance purchases, and the link between taxation and investment in various types of energy conserving equipment.

With respect to the corporate tax, controversy still runs high on the choice between marginal investment incentives, such as accelerated depreciation allowances, and "average" incentives, such as reductions in the statutory tax rate on corporate income. The effect of taxation on corporate financial policies is also an issue that has attracted relatively little attention from public finance economists and corporate finance economists in recent years, but where re-investigation seems overdue. Long-standing puzzles, such as "why do firms pay dividends?" have become less puzzling over time as corporate financial policy has moved away from high payout rates and many young firms have decided not to pay dividends. Yet the impact of the tax system on the choice between debt and equity, and on the form of compensation, particularly the choice between stock option based compensation and traditional wage income, remains an open issue. There is a clear need for a conceptual framework that would make it possible to evaluate the efficiency costs of different tax related distortions in the corporate finance area.

Tax and Expenditure Programs in a Lifecycle Perspective

There is a growing dissatisfaction with the traditional "snapshot" incidence models for analyzing tax and expenditure policies. There has already been some progress toward analyzing such policies in a lifecycle context, with explicit recognition that households that are in low income positions at one point in time may be in more favorable positions at other dates, and vice versa. Moreover, analyzing the incidence of programs such as Medicare or Social Security that combine taxes during one part of the lifecycle with transfers during another part requires a lifecycle rather than a static setting. Part of the required research involves the measurement of transition rates across income positions as households age. Another part involves measuring the impact of policies on households of different ages and income circumstances. As longitudinal data sets increasingly provide the wherewithal for studying incidence issues in long-term frameworks, lifecycle methods of policy analysis are sure to grow in interest and sophistication.

Medicare illustrates how the lifecycle perspective can generate novel insights on the distributional burden of expenditure programs. At any age, the beneficiaries of Medicare in lower income ranges consume more medical care per capita than the better-off participants. But, if one stratifies households by lifetime income and asks how the total value of Medicare benefits varies with income, it appears that higher income households, who live longer and receive Medicare benefits for more years, may do better than their lower-income counterparts.

Economics of National Security

Since the early 1960s, the share of government expenditure devoted to national defense has declined sharply. The end of the Cold War provided an important opportunity to reduce the share of national resources devoted to the military, and this reduction in defense outlays was an important contributor to the shift from federal deficits to federal surpluses in the late 1990s. Recent world events suggest that we are likely to see rising expenditures on defense and other security programs. This will raise new issues for researchers in public economics. How should the costs of reducing the likelihood of terrorist attacks be divided between the government and the private sector? How should the costs of a global initiative be divided across countries? What, if anything, can economists offer to help guide the cost-benefit calculations that are likely to be central to formulating policy in these areas?

3. Conclusion

Public economics is timeless, yet dynamic. Many of the basic principles of optimal tax design were enunciated in Adam Smith's *Wealth of Nations*, and they were surely recognized much earlier by thoughtful monarchs and finance ministers. Yet research advances in the last few decades have provided new insights on many aspects of how the tax system affects household and firm behavior. These insights have implications for optimal tax design. Similarly, although large-scale government spending has been evident in various regimes since antiquity, we are still discovering interesting new perspectives on the optimal design of both exhaustive expenditure programs and of transfer programs.

Public economics offers exciting opportunities to investigate current issues in public policy with the most recent innovations in both economic theory and econometric method. Much of the research progress of the last few decades, and many of the challenges ahead, involve empirical research on how tax policies and expenditure programs affect household and firm behavior. One must not lose sight, however, of the critical role that economic theory plays in advancing the field of public economics. Public economics is fundamentally a "general equilibrium" field. It is concerned not only with the first-round effects of government policies on economic behavior, but also with the ultimate effects that operate through general equilibrium changes in prices and behavior. As such, analyzing most questions in public economics requires more than simply a partial equilibrium model of household or firm behavior. Notions of market equilibrium, whether in broad markets for factors such as labor and capital, or in specific markets like those for tobacco or other products that are the subject of excise taxes, play a central role in policy analysis. Economic theory provides the grammar that we use to discuss both the effects of policies and the optimal design of future policies. Part of the dynamism of public economics derives from the wonderful opportunity it offers for theory to influence empirical work, and vice versa.

Note

1. A forthcoming issue of the *Journal of Public Economics* will include a symposium in which several of the leading scholars who contributed

to the advance of public economics during the last three decades review both recent research accomplishments and suggest directions for future work. Another excellent source of information on recent developments is the *Handbook of Public Economics,* volumes 3 and 4, edited by Alan Auerbach and Martin Feldstein.