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Program Report

The Economics of Aging

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NBER's project on the Economics of Aging has been underway for approximately 18 months. Its goal is to further our understanding of the determinants of the economic well-being and the health status of the elderly, and to estimate the consequences for the elderly and for the population at large of an increasingly older population with longer individual life spans. We expect the project to continue for several years.

Initial NBER studies on aging were presented at a conference in New Orleans in March 1987; descriptions of the papers delivered may be found in the "Conferences" section of this issue of the *NBER Reporter*. A second conference is planned for April 1988. Members of the project also met during the 1986 Summer Institute and more than a dozen papers on the economics of aging will be presented at the 1987 Summer Institute.

Most of the research to date falls within four categories: (1) housing, living arrangements, and family support; (2) labor force participation and retirement; (3) the economics of health and health care; and (4) financial status. This report summarizes the initial research findings of the project.

Housing, Living Arrangements, and Family Support

A large proportion of the savings of the elderly is in the form of housing. Therefore, the life-cycle theory of consumption suggests that many older persons should reduce housing wealth as they age in order to maintain consumption levels. A related theory states that many elderly are liquidity constrained and would like to divest themselves of housing wealth to increase their consumption in other forms, were it not for the large transaction costs, both economic and psychic, of moving from one dwelling to another. Both hypotheses are questioned by Dan McFadden and Jonathan Feinstein

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This issue of the *Reporter* highlights the Bureau's project on the Economics of Aging. Next, B. Douglas Bernheim describes his research in private saving and public policy and Matthew D. Shapiro discusses capital formation and productivity fluctuations. After the quarterly Economic Outlook Survey are biographical sketches, news of NBER conferences, the Conference Calendar, and other NBER news and reports. The *Reporter* concludes with short summaries of recent NBER Working Papers.

in "The Dynamics of Housing Demand by the Elderly: I. Wealth, Cash Flow, and Demographic Effects" and by Steven F. Venti and myself in "Aging, Moving, and Housing Wealth."

While the McFadden/Feinstein paper is based on data from the Panel Study of Income Dynamics and the Venti/Wise paper on the Retirement History Survey, both papers study the impact of diverse social and economic variables on the housing decisions of the elderly. They focus on the decision to move and, having chosen to move, whether to increase or decrease housing equity and/or the user cost of housing.

McFadden and Feinstein find that the higher satisfaction with housing is, the less mobility there is, and the less likely the elderly are to "downsize." They conclude that this and other findings call into question the

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life-cycle model as traditionally formulated. In addition, they find only weak evidence that liquidity constraints affect the housing conditions of the elderly. This result is consistent with the apparent lack of enthusiasm among elderly homeowners for reverse annuity mortgages. Their analysis also reveals a strong relationship between retirement and changes in family composition (on the one hand) and in housing mobility (on the other).

Venti and I confirm that families with high incomes typically also have high housing wealth and that families with low incomes typically have low housing wealth. Thus, reverse mortgage schemes have a limited potential for increasing the consumption of the low-income elderly. We find that families with high incomes but low housing wealth are somewhat more likely to move than families with low incomes but high housing wealth. The latter are most likely to be liquidity constrained. Our analysis also reveals that the elderly who move are as likely to increase as to decrease housing equity.

Venti and I also find that the typical elderly person who moves is not liquidity constrained, and that the economic and psychic costs apparently are not major reasons that the elderly reduce housing equity as they age. We conclude that the absence of a well-developed market for reverse mortgages apparently can be explained by a lack of demand for these financial instruments. Finally, like McFadden and Feinstein, we find a substantial relationship between retirement and changes in family composition and in housing mobility.

Konrad Stahl addresses similar questions in "Housing Patterns and Mobility of the Aged: The United States and West Germany." The age distribution of the West German population today is very similar to the distribution predicted for the United States in the year 2000. Like McFadden/Feinstein and Venti/Wise, Stahl finds that in both West Germany and the United States moving is associated with substantial increases in housing cost-to-income ratios. On the other hand, consumption of housing services, measured by rooms per family member, declines when the elderly move. Again, this is true in both Germany and the United States. He also concludes that the potential for adjusting housing consumption by moving is much greater in the United States than in Germany, since elderly Americans are approximately four times as likely to move as their German counterparts are. Finally, Stahl concludes that a strong impediment to mobility in Germany is the apparent rent advantage given to existing tenants. If they move, they typically must pay substantially more for rental housing. Venti and I report a similar finding for the United States.

In "Household Dissolution and the Choice of Alternative Living Arrangements of Elderly Americans," Axel Börsch-Supan studies the economic and demographic determinants of the decision to live independently versus in a shared accommodation. He decomposes households into separate family nuclei and finds that approximately one-third of elderly family nuclei do not live independently. However, while this proportion has increased among the general population in

the early 1980s, it has decreased among elderly Americans. More than 70 percent of elderly nuclei not living independently live with their adult children. In most of these cases, the parents head the common household. Among these two-generation households between 1974 and 1983, an increasing percentage was headed by the parent generation rather than by the adult children. He attributes this development to the increasing difficulty of finding affordable housing for first-time home buyers. Those children who "take in" their parents have about twice the income level of the average second-generation (children) nuclei family. Finally, he concludes that the choice of living arrangements is determined primarily by demographic variables.

Laurence J. Kotlikoff is studying the extended family using a survey sponsored by NBER and the Hebrew Rehabilitation Center for the Aged (Boston). The survey will collect information on children of the elderly residing in Massachusetts and ultimately will provide a unique source of information about the behavior of the extended family. His preliminary findings indicate that a significant minority of the elderly, many of whom need assistance with activities of daily living (the "vulnerable elderly"), have little or no contact with their children. There appears to be less contact between children and the vulnerable elderly than between children and the nonvulnerable elderly, with the least amount of contact between children and the institutionalized elderly. In addition, although many of the parents in the sample are poor, financial support from their children is uncommon, other than in the form of shared housing. The initial impression conveyed by the data is that many of the elderly are well cared for by their children, while a significant minority either have no children or have no children who provide significant time or care.

Labor Force Participation and Retirement

Kotlikoff and I are continuing our work on the incentive effects of private pension plans. In "Employee Retirement and a Firm's Pension Plan" we analyze the relationship between pension wealth accrual and retirement, based on the experience of a *Fortune* 500 firm. It is clear that departure rates from the firm are very strongly related to the incentive effects inherent in pension wealth accrual. Because of strong incentive effects in the pension plan, especially the advantageous early retirement provisions, only about 10 percent of the firm's employees at age 50 are still working for the firm at age 65; fewer than 50 percent are still working for the firm at age 60. Kotlikoff and I note that while a great deal of effort has been directed toward estimating the effects of Social Security provisions on labor force participation, much less attention has been given to the effects of private pension plans. We suggest that pension plan provisions have had a much greater effect on retirement than the recent changes in Social Security benefits have had.

In "Social Security and the Determinants of Full and Partial Retirement: A Competing-Risks Analysis," Glenn Sueyoshi considers the determinants of retirement,

taking explicit account of full versus partial retirement. He finds that increases in Social Security benefits in the early 1970s increased the probability of full retirement but reduced the probability of partial retirement. However, the predicted effects are relatively small, and the results indicate that Social Security is not the primary factor behind the reduction in labor force participation by the elderly in the 1970s.

John Rust is developing "A Dynamic Programming Model of Retirement Behavior." His model accounts for the sequential nature of the retirement decision, and the role of expectations about uncertain future variables such as the worker's future life span, health status, marital and family status, earnings from employment, assets, Social Security, and other variables. He has directed his primary work to date toward the development of an algorithm to estimate such a model from observed data. He hopes that his procedure will be useful for others in the analysis of similar problems.

Financial Status

About 80 percent of the elderly poor are single; 60 percent of the elderly poor are widows. Two project papers analyze the reasons for the relatively greater poverty of widows and their future prospects. In "The Wealth and Poverty of Widows: Assets Before and After the Husband's Death," Michael D. Hurd and I trace backward to the financial status of the couple when the husband was alive and attempt to explain how widows become poor. We find that, based on standard definitions of poverty, the death of a husband very often induces poverty of a surviving widow. A large fraction of the wealth of the couple is lost when the husband dies. This loss is especially large when the widow being observed is poor: almost all the private pension wealth previously accrued by the married couple is lost at the husband's death. In addition, the prior households of poor widows saved less than the households of nonpoor widows did. The typical couple had very little life insurance before the husband's death and, therefore, had no way to make up the loss in wealth when he died.

In "The Poverty of Widows: Future Prospects," Hurd estimates the future economic status of widows. He begins by estimating the future financial status of the population of the Retirement History Survey. He then considers changes in the initial conditions of that population, such as increased pension coverage and increased Social Security benefits, and their implications for the financial status of widows. By the year 2000, up to 60 percent of the surviving group of 1979 widows will be below the poverty level, based on Hurd's consumption measure of poverty. He finds that increases in private pension coverage and survivorship rules will do little to reduce their poverty. Increased life expectancy also will have only a small effect on their poverty. Only increases in Social Security benefits will have a substantial effect on the proportion of widows who are poor.

B. Douglas Bernheim is studying the relationship among expectations of the elderly about future income,

age of retirement, and other variables and their actual realizations. In "Social Security Benefits: An Empirical Study of Expectations and Realizations" (NBER Working Paper No. 2257, May 1987), he analyzes individual predictions about future Social Security benefits compared with benefits actually received. He shows that individuals' estimates of their future benefits would be greatly improved if they had information on what their benefits would be if they were to retire now.

In "The Time of Retirement: A Comparison of Expectations and Realizations," Bernheim studies the accuracy of expectations concerning the timing of retirement. He finds that expectations about age of retirement are highly accurate. More than 60 percent of the elderly who had expected to retire within four years actually did retire within one year of the expected date.

One form of saving for retirement is an Individual Retirement Account (IRA). Since 1982, when IRAs became available to all employees, they have become a popular form of saving. In "Have IRAs Increased U.S. Saving? Evidence from Consumer Expenditure Surveys" (NBER Working Paper No. 2217, April 1987), Venti and I analyze the net saving effect of contributions to these accounts. We conclude that the vast majority of contributions to these accounts has represented net saving; without these accounts, the national saving rate would have been even lower than it was. We postulate that if the accounts were to continue to be promoted, they could be a very important form of saving for retirement and that, for those who make contributions, accumulated wealth at the age of retirement would be much higher than it would have been otherwise.

Health

Alan M. Garber has begun a series of studies on the economics of health care, focusing on long-term care and the evaluation of the worth of health interventions for the elderly. His initial work, on "Long-Term Care, Wealth, and Health of the Disabled Elderly Living in the Community," considers the relationship between financial status and hospital, nursing home, and home health care utilization for a sample of noninstitutionalized disabled elderly. It is based on data from the 1982 National Long-Term Care Survey. He finds that living alone is associated with a marked increase in the use of paid home health care. Garber's preliminary results suggest that most of the disabled elderly who live in the community have significant resources, and that home equity and income do not decrease with the number of functional impairments. The results confirm that the elderly who live alone use some long-term care services heavily, and that informal supports (for example, children) appear to be an important source of care.

John B. Shoven, Jeffrey O. Sundberg, and John P. Bunker analyze "The Social Security Cost of Smoking" (NBER Working Paper No. 2234, May 1987). One cost of smoking is a reduction in the expected Social Security benefits that results from a decreased life expectancy induced by smoking. The three authors find the expected loss of net benefits accompanying smoking

to be very large relative to the estimates of medical costs and lost wages resulting from smoking. Single nonsmoking men can expect to receive a net transfer from Social Security of \$3436, while smokers receive expected benefits \$17,782 short of their expected contributions. The expected Social Security cost of smoking for single men age 20 thus exceeds \$21,000. Couples who both smoke can expect \$30,000 less in Social Security benefits than nonsmoking couples do.

Research Summaries

Private Saving and Public Policy

B. Douglas Bernheim

The private saving rate during the 1980s has been disappointing. Despite the enactment of a number of policies designed to make saving and investment more rewarding (such as liberalized individual retirement accounts and Keogh plans, reduced capital gains taxes, and increased investment incentives at the corporate level), virtually every measure of private saving has declined substantially since the mid- to late 1970s. Recent tax reforms, which reverse prior policy by eliminating many provisions favorable to capital income, could potentially accentuate this decline in coming years. In view of these trends, economists should have a better understanding of the determinants of private saving and the relationships between private saving and public policy.

Over the last several years, I have been engaged in research designed to address various aspects of these issues. My work has two parts: first, I consider the determinants of private saving; second, I study specific public policies.

Determinants of Private Saving

Much of the academic debate over private saving concerns the validity of the Life-Cycle Hypothesis (LCH). This hypothesis holds that consumers exercise great foresight when forming long-term financial plans and choose the appropriate level of saving to achieve some carefully premeditated path of consumption over their lifetimes. The LCH has very strong implications for the effects of various fiscal policies.

I focus on two aspects of the LCH. The first is the importance of intergenerational linkages. Over the

past decade, economists have become increasingly aware that the existence of significant intergenerational altruism among a large segment of the population would represent a major departure (in terms of its implications for public policy) from the standard life-cycle view. This realization was caused in large part by the work of Robert J. Barro, who points out that altruistically motivated transfers between parents and children could potentially neutralize the effects of public policy regarding the use of deficits and the provision of Social Security.¹ Barro bases his conclusions on the observation that, in essence, these policies are transfers between successive generations. To the extent that generations are already linked through private transfers, the average individual will tend to adjust gifts and bequests to offset undesired redistribution arising from public policy.

This view has been highly influential and indeed has led some analysts to downplay the potentially adverse consequences of large budget deficits. Since its validity rests squarely on the assumption that successive generations are linked through gifts and bequests, evidence on the importance of intergenerational altruism merits close scrutiny.

One potential avenue for distinguishing bequest motives is to examine patterns of wealth holdings among the retired. If these individuals save solely to provide for their own consumption, then their resources should decline with age. On the other hand, the desire to leave a bequest may cause many consumers to maintain relatively high levels of wealth long after retirement. Data drawn from the Retirement History Survey (RHS) reveal that conventional measures of wealth do decline substantially for the bulk of individuals after they retire. However, most retirees hold a substantial fraction of their financial resources in the form of annuities (private pensions and Social Security). Based upon measures of wealth that include the value of annuities, there appears to be little or no tendency for retirees to draw down their resources. Formal statistical analysis does not support the view that private saving is motivated purely by the desire to redistribute consumption over the life cycle.²

While the preceding observations suggest that many individuals may be motivated by the desire to leave significant bequests, they shed relatively little light on the nature of these motives. Love and affection no doubt play a significant role in determining the size and distribution of bequests. Nevertheless, other factors also may come into play. In work with Andrei Shleifer and Lawrence H. Summers, I investigate the possibility that testators use bequests to influence the behavior of po-

tential beneficiaries.³ Such influence may be overt, as when parents threaten to disinherit miscreant offspring, or more subtle, as when parents reward more attentive children with potential heirlooms.

Again, data drawn from the RHS suggest that this kind of behavior may be extremely common. In addition, bequest motives of this type help to explain several empirical observations that seem inconsistent with other possibilities. These findings are of significant interest for a variety of reasons. Our analysis suggests several important interactions between demographic and economic issues and may help to explain a number of diverse phenomena, including living arrangements among the elderly and international differences in saving rates. In addition, Barro's arguments about the irrelevance of certain fiscal policies (noted above) do not hold up when intergenerational transfers entail a quid pro quo.

In a separate project, I focus on a second aspect of the LCH: the assumption that consumers think seriously about and plan coherently for the relatively distant future. As a participant in NBER's Project on the Economics of Aging, I am studying the accuracy and behavioral importance of expectations among individuals approaching retirement. In one paper, I compare expected Social Security benefits (reported by individuals prior to retirement) to actual realizations of benefits.⁴ I find strong evidence that most consumers do think seriously about future financial events. While they do not form expectations on the basis of all available information, they do appear to be reasonably competent at making relatively accurate forecasts conditional upon the information that they do use. Indeed, the data broadly suggest that consumers correctly anticipated the general effect of significant legislative changes in the level of Social Security benefits during the early 1970s. However, the study also indicates that the Social Security Administration could improve individuals' forecasts of future benefits significantly by providing each program participant with a yearly statement containing a calculation of benefits based upon existing law.

In another paper, I compare expected dates of retirement with actual retirement dates.⁵ This study complements the first, in that the emphasis is on the accuracy of an economic plan rather than a forecast of an event that, for the most part, is determined externally. The data strongly suggest that individuals form serious economic plans and ordinarily stick to them.

¹B. D. Bernheim, A. Shleifer, and L. H. Summers, "The Strategic Bequest Motive," NBER Reprint No. 697, March 1986, and *Journal of Political Economy* 93, 6 (December 1985), pp. 1045-1076.

⁴B. D. Bernheim, "Social Security Benefits: An Empirical Study of Expectations and Realizations," NBER Working Paper No. 2257, May 1987.

⁵B. D. Bernheim, "The Timing of Retirement: A Comparison of Expectations and Realizations," NBER Working Paper, forthcoming. A brief description of this paper appears in "The Economics of Aging" conference report in this issue of the NBER Reporter.

¹R. J. Barro, "Are Government Bonds Net Wealth?" *Journal of Political Economy* 81 (1974), pp. 1095-1117.

²B. D. Bernheim, "Dissaving after Retirement: Testing the Pure Life-Cycle Hypothesis," NBER Working Paper No. 1409, July 1984, and *Issues in Pension Economics*, Z. Bodie, J. B. Shoven, and D. A. Wise, eds. Chicago: University of Chicago Press, 1987.

All of the studies mentioned earlier focus on individual behavior. But since a very large fraction of private saving in the United States is institutional (that is, it takes place through pension funds), it is impossible to understand all the determinants of the saving rate without careful study of institutions. In work with John B. Shoven, I argue that the nature of the funding of defined-benefit plans may be an important reason why personal saving has not responded positively to high real interest rates and tax incentives during the last five years.⁶ From a firm's standpoint, funding the promised pension is a target, and higher rates of return permit reaching that target with lower contributions. Thus, according to the Flow of Funds Account of the Federal Reserve System, between 1982 and 1984 net pension contributions declined from 6 percent of disposable personal income to 4 percent. This is sufficient to explain the disappointing performance of the personal saving rate.

Public Policy on Saving

A second portion of my research focuses on the manner in which specific fiscal instruments, including budget deficits, Social Security, and capital income taxation, affect national saving and capital accumulation. As mentioned earlier, some analysts hold the notion that, by adjusting gifts and bequests, individuals may offset public policies involving intergenerational transfers partially or completely; these analysts have downplayed the potentially adverse effects of deficits and Social Security on capital accumulation. In a recent paper, Kyle Bagwell and I examine the internal logic of this argument and find it lacking.⁷ We point out that the argument is based upon certain implicit assumptions that lead to a variety of absurd conclusions. For this reason, we reject the view that private transfers might neutralize the effects of public policies.

In a separate study, I critically evaluate the existing body of theory and evidence on the effects of government budget deficits.⁸ Unfortunately, efforts to measure the economic effects of deficits directly are fraught with difficulties that, taken together, may well be insuperable. Therefore, it is not at all surprising that these studies have proved inconclusive. In light of this fact, there is little alternative but to extrapolate from theoretical reasoning and indirect behavioral evidence, suggesting that budget deficits significantly stimulate current consumption and depress long-run capital accumulation. The study also presents new evidence,

⁶B. D. Bernheim and J. B. Shoven, "Pension Funding and Saving," NBER Working Paper No. 1622, May 1985, and *Pensions and Retirement in the United States*, J. B. Shoven, ed. Chicago: University of Chicago Press, forthcoming.

⁷B. D. Bernheim and K. Bagwell, "Is Everything Neutral?" NBER Working Paper No. 2086, December 1986, and *Journal of Political Economy*, forthcoming.

⁸B. D. Bernheim, "Ricardian Equivalence: An Evaluation of Theory and Evidence," NBER Working Paper, forthcoming, and NBER Macroeconomics Annual 1987, S. Fischer, ed. Cambridge, MA: M.I.T. Press, forthcoming.

based on international comparisons, that corroborates this view.

Many authors also have investigated the effect of Social Security on private saving. My own study of this issue finds that previous results may underestimate the depressive effect of Social Security on personal wealth accumulation by a factor of three or more.⁹ These earlier studies measure the value of future Social Security benefits in a way that is inconsistent with the behavioral hypothesis on which the studies are based. The use of an appropriate measure of benefit value dramatically alters the empirical results.

The final policy issue that I have studied is the effect of taxation on private capital accumulation. In work with Shoven, I examine the importance of taxes relative to credit market conditions as determinants of the cost of capital.¹⁰ We analyze real interest rates in the United States, United Kingdom, West Germany, and Japan. Over the relevant period (the 1970s and 1980s) persistent interest rate differentials exist. We model the tax systems of the four countries and calculate the cost of financial capital, decomposing the differentials among the costs of capital in the various countries into tax and nontax components.

We find that, under prevailing tax systems, differences in the cost of capital between countries are largely attributable to differences in domestic credit market conditions rather than to taxes. Nevertheless, taxes cannot be dismissed completely. In particular, eliminating the taxation on income from capital either at the personal or corporate levels (or both) would have a profound effect on the cost of capital in the United States relative to other countries. Under one plausible scenario, the adoption of a consumption tax would eliminate more than 60 percent of the differential between the cost of capital in the United States and Japan.

In another paper, I focus specifically on the impact of estate taxes on personal saving and portfolio allocation.¹¹ Previously, a number of commentators have noted that common estate planning techniques allow wealthy individuals to pass on vast resources essentially tax free. In addition, the portfolio reallocations arising from the tax avoidance schemes depress income tax revenues. I find that prior to the Tax Reform Act of 1986, this effect easily could have offset all revenues collected through the estate tax. The recent Tax Reform Act vitiates this conclusion only partially.

⁹B. D. Bernheim, "The Economic Effects of Social Security: Toward a Reconciliation of Theory and Measurement," NBER Working Paper No. 1511, December 1984, and *Journal of Public Economics*, forthcoming.

¹⁰B. D. Bernheim and J. B. Shoven, "Taxation and the Cost of Capital: An International Comparison," in *The Consumption Tax: A Better Alternative?* American Council for Capital Formation, forthcoming.

¹¹B. D. Bernheim, "Does the Estate Tax Raise Revenue?" NBER Working Paper No. 2087, December 1986, and *Tax Policy and the Economy*, L. H. Summers, ed. Chicago: University of Chicago Press, forthcoming.

Capital Formation and Productivity Fluctuations

Matthew D. Shapiro

Standard theories imply that the cost of capital—a composite of the purchase price of investment goods, tax variables, and the cost of funds—should be a major determinant of fixed investment. Consequently, one might expect to find a major correlation between changes in fixed investment and changes in the cost of capital.

Yet, data for the U.S. economy show a very weak association between the cost of capital and investment fluctuations. Instead, investment fluctuations are strongly associated with fluctuations in output.

These correlations are difficult to reconcile with either neoclassical or neo-Keynesian accounts of capital formation. The neoclassical theory, in which firms choose the capital stock so that the physical return to an extra unit of capital equals the cost of capital, would seem to predict a strong relationship between the cost of capital and capital formation.

Similarly, neo-Keynesian models make strong predictions about the cost of capital and fluctuations in investment. The interest rate is an important component of the cost of capital. If the interest rate does not affect investment, then one important link in the Keynesian transmission mechanism of monetary shocks to the goods market is broken.

What accounts for the strong correlation of investment and output and the weak correlation of investment and the cost of capital? Recent research suggests that productivity fluctuations can explain year-to-year fluctuations in output. Under the assumption that technical change is disembodied, changes in productivity will change the physical returns to capital. For example, an increase in productivity will increase the return to capital and hence lead to increased investment. These changes in productivity occur much more frequently than do the changes in tax laws that dominate long-run changes in the cost of capital. At business cycle frequencies, productivity fluctuations may be more important than the cost of capital in determining investment fluctuations, even though the cost of capital is important in determining the level of the capital stock.

Understanding the joint dynamics of output, investment, and the cost of capital is important for economic policy. First, if the cost of capital does not affect investment, then short-run swings in interest rates will leave investment unchanged. In the absence of a meaningful relationship between interest rates and investment, one of the crucial channels for monetary policy (that is, tight money squeezing investment) will be eliminated. Second, tax policy often is designed to affect the rate of investment. Policies such as investment tax credits and accelerated depreciation are meant to promote capital formation. Hence, knowing the degree to which changes in the cost of capital will affect investment is crucial to evaluating such tax policies.

This article first outlines a test of whether the observed fluctuations in productivity are truly taking place. Then it discusses the estimation of the demand for capital in the presence of productivity fluctuations. Finally, it explains how the joint movements of investment, output, and the cost of capital are consistent with the view that shocks to productivity are a key source of economic fluctuations.

Sources of Shocks

The claim that productivity shocks are an important source of output and investment fluctuations over the business cycle is controversial. Growth in productivity can be calculated as growth in output minus a weighted average of growth in inputs (capital and labor). Measured productivity grows more in booms than in recessions; that is, productivity growth is procyclical. Keynesian theories imply that this procyclicality arises because measured productivity has a demand component. Hence, the procyclicality of productivity is a consequence, not a cause, of the business cycle.¹

On the other hand, productivity fluctuations may be an important cause of business cycles. This line of argument is known as the theory of Real Business Cycles.² Without endorsing all of the assumptions of real business cycle theories (such as continuous clearing of the labor market), it is possible to maintain that productivity shocks are an important impetus to aggregative fluctuations.

To establish whether observed fluctuations in productivity are actually occurring, I compare two measures of productivity shocks.³ The first and standard one is based on output quantity growth net of input quantity growth (the Solow residual). The second is based on output price growth net of input price growth (the dual productivity residual). If observed productivity shocks are truly shocks to supply, then these two measures should be identical. Under the Keynesian alternative that demand shocks are driving output, the measures should differ. Keynesian theories of labor hoarding, or of monopolistic excess capacity, predict that measured productivity is procyclical. Output can increase without an increase in inputs when demand increases. Specifically, the difference between the quantity-based measure and the price-based measure should be procyclical.

¹R. E. Hall, "Market Structure and Macroeconomic Fluctuations," NBER Reprint No. 845, April 1987, and Brookings Papers on Economic Activity 2 (1987), pp. 285-322, observes that the assumption that measured productivity has an aggregate demand component implies an assumption that prices are not set competitively.

²F. E. Kydland and E. C. Prescott, "Time to Build and Aggregate Fluctuations," *Econometrica* 50 (November 1982), pp. 1345-1370.

³M. D. Shapiro, "Are Cyclical Fluctuations in Productivity Due More to Supply Shocks or Demand Shocks?" NBER Working Paper No. 2147, February 1987, and American Economic Review Proceedings 77 (May 1987), pp. 118-224.

I test these hypotheses using panel data on U.S. industries. For most industries, the hypothesis that both measures of productivity are the same holds true. More importantly, deviations between the two measures essentially are not cyclical. Therefore, these tests support the view that observed productivity shocks are truly productivity shocks. In addition to providing support for the explanation of the output/investment correlation, this finding should have broad implications for debates over the sources of business cycles. In particular, it calls into question models that have productivity responding positively to aggregate demand shocks.

Estimation of the Demand for Capital

I estimate the demand for capital based on the representative firm's problem of intertemporal profit maximization. Productivity shocks enter the profit function explicitly through the specification of the technology. The profit-maximization problem implies that the expected marginal product of capital equals the expected cost (stochastic first-order conditions). This condition is explicitly intertemporal because of the durability and cost of adjusting the capital stock. Expectations errors are uncorrelated with the information available when the expectation was formed. Consequently, the stochastic first-order condition, which holds only in expectation, can be estimated using the actual data and an instrumental variables procedure.⁴ The estimated first-order conditions are then solved to yield a demand for capital.

This procedure for estimating the demand for capital is immune from several important criticisms of much of the work on the demand for capital. First, the estimated demand for capital is based explicitly on technology and policy. The key policies considered are tax rules that affect the cost of capital. Therefore, the model can accommodate structural shifts that arise when policy changes (Lucas's famous critique that many econometric models will be unstable when policy changes).⁵

Second, the equation for the demand for capital is based on the firm's intertemporal profit-maximization problems, which, because of the durability of capital, are long term. Summers has criticized conventional investment equations that focus on short-run swings in investment.⁶

⁴M. D. Shapiro, "The Dynamic Demand for Capital and Labor," NBER Reprint No. 860, May 1987, and *Quarterly Journal of Economics* 101 (August 1986), pp. 513-542; and "Capital Accumulation and Capital Utilization: Theory and Evidence," NBER Working Paper No. 1900, April 1986, and *Journal of Applied Econometrics* 1 (July 1986), pp. 211-234.

⁵R. E. Lucas, Jr., "Econometric Policy Evaluation: A Critique," Carnegie-Rochester Conference on Public Policy 1 (1976). *Reduced-form investment equations are one of Lucas's examples.*

⁶L. H. Summers, "Requiem for the Investment Equation," unpublished, Harvard University, 1986.

Finally, the estimates take into account how observed productivity shifts the production function. This obviates the severe problem of simultaneous equations bias that would be present otherwise.

The demand for capital estimated by this technique displays rates of adjustment that are plausible. About half of the adjustment to a change in the cost of capital takes place after one year. Moreover, the estimated magnitudes of the adjustments are important. For example, the estimates imply that if the reductions in the cost of capital mandated in the 1981 tax law had remained permanent, the long-run capital stock would have been 5 percent higher than it would have been otherwise.

Dynamics of Investment, Output, and the Cost of Capital

Suppose that firms in the economy face shocks to productivity. These shocks will affect both their ability to produce and their desire to invest. A firm may become more productive either through adoption of a new technique or by an improvement in the quality of its workers. This increase in productivity will raise both output and investment. Output will increase because the firm becomes more efficient and can produce goods at a lower price. Investment will increase both because new capital may be required to implement the productivity changes and because the marginal product of capital has increased. Productivity shocks can be the underlying factor that determines both investment and output. Therefore, one might expect to see the large co-movements of investment and output that we do see in the data.

Based on the estimates discussed in the previous section and estimates of the processes governing productivity and other shocks, the model yields predictions about the joint movements of the key aggregates: investment, output, labor, interest rates, and a measure of productivity shocks. These predictions are compared with the movements of the actual data for the U.S. economy. The models fit the data well.

First, the productivity shock appears to be an important joint determinant of both investment and output, just as the theory predicts. Second, the strong correlation of investment and output found in the data is replicated in the model. Finally, in both the model and the data, the correlation of interest rates and investment is very weak. Calculations show that this weak correlation arises because productivity movements swamp the effect of interest rates in U.S. data. A large and sustained change in interest rates or the tax variables that determine the cost of capital will affect investment. Conventional techniques that ignore the key role of productivity shocks may fail to find this effect.

Economic Outlook Survey

Second Quarter 1987

Victor Zarnowitz

According to the June survey of 28 professional forecasters taken by NBER and the American Statistical Association, the median forecasts show the economy continuing along the path of a relatively slow but steady expansion. Having grown 2.5 percent in 1986, real GNP is expected to gain 2.6 percent this year and 2.7 percent the next. These projections are similar to those made by the group three months ago. Yet a closer look at the individual forecasts and their composition reveals increasing risks and uncertainties. The probabilities of a serious slowdown or recession starting in the year ahead are seen as higher. Inflation and interest rates are considered more likely to rise than decline.

Many Forecasters Worry about a Sluggish 1988

Expressed at annual rates (a.r.), forecasts of real GNP growth average 2.2 percent, 2.6 percent, 3.2 percent, 2.6 percent, and 2.8 percent for the five successive quarters 1987:2-1988:2; over the period as a whole, the expected gain is 2.8 percent. But the individual point predictions differ considerably, as shown by the following percentage distributions:

Percentage Change in Real GNP	Mean Response (Percentage)	
	1987:2 to 1988:2	1987-8
4.0 percent or more	4	0
3.0 to 3.9 percent	50	40
2.0 to 2.9 percent	31	44
Less than 2.0 percent	15	16
Total	100	100

Most respondents expect growth to exceed 3 percent in 1987:2-1988:2 but to fall below 3 percent in 1987-8. The ranges of the respective forecasts are 0.0-4.5 percent and 0.4-3.4 percent.

Chances of a Recession Still Low but Rising

The probabilistic forecasts provide more direct measures of uncertainty. Their dispersion is much greater than that of the corresponding point forecasts. They also show a substantial shift downward when growth prospects for 1987 and 1988 are compared:

Percentage Change in Real GNP	Mean Response (Percentage)	
	1986-7	1987-8
4.0 percent or more	10	10
2.0 to 3.9 percent	67	50
0 to 1.9 percent	20	32
Negative	3	8
Total	100	100

The average of individual assessments that the economy's output will decline are 13, 12, 15, 20, and 26 out of 100 in the five quarters through 1988:2. More of the responses fall into the mean probability classes that signaled danger in the past (31-40 percent, 41-50 percent, and higher) than previously in this expansion.

Inflation Somewhat Higher— Not Accelerating

The median forecasts show the GNP implicit price deflator (IPD) rising 3.1 percent in 1986-7, 3.9 percent in 1987:2-1988:2, and 4.0 percent in 1987-8. The quarterly forecasts for 1987:2-1988:2 vary between 3.7 percent and 4.2 percent a.r. Compared with the previous survey, most predictions of inflation are higher, but the revisions in either direction tend to be relatively small. The probabilistic forecast distributions show a clear but moderate shift toward higher inflation in 1988.

Percentage Change in IPD	Mean Response (Percentage)	
	1986-7	1987-8
8.0 percent or more	1	3
6.0 to 7.9 percent	4	8
4.0 to 5.9 percent	20	45
2.0 to 3.9 percent	70	38
Less than 2.0 percent	5	6
Total	100	100

Few forecasts indicate that inflation may accelerate in the near future. This is consistent with the paucity of predictions that macroeconomic activity is about to heat up and enter a boom stage. The consumer price index, reflecting the effects of costlier imports, is to rise 3.8 percent in 1986-7 and 4.5 percent in 1987-8, according to the median forecasts. The quarterly figures for 1987:2-1988:2 fall into the narrow range of 4.2-4.4 percent. Here the revisions from the previous survey are larger than for IPD, averaging about 0.5 percent.

Moderate Rises and Upward Revisions in Interest Rate Forecasts

The three-month Treasury bill rate is expected to increase gradually from 5.7 percent to 6.3 percent between 1987:2 and 1988:2. The annual averages are 5.8 percent for 1987 (this could be slightly lower than in 1986) and 6.3 percent for 1988 (indicating no further rise in the second half of next year).

Projections of GNP and Other Economic Indicators, 1987-8

	Annual				
	1986 Actual	1987 Forecast	1988 Forecast	Percent Change	
				1986 to 1987	1987 to 1988
1. Gross National Product (\$ billions)	4206.1	4444.5	4750.8	5.7	6.9
2. GNP Implicit Price Deflator (1982 = 100)	114.5	118.0	122.7	3.1	4.0
3. GNP in Constant Dollars (billions of 1982 dollars)	3674.9	3772.2	3873.0	2.6	2.7
4. Unemployment Rate (percent)	7.0	6.6	6.5	-0.4 ¹	-0.1 ¹
5. Corporate Profits After Taxes (\$ billions)	134.0	141.8	156.5	5.8	10.4
6. Nonresidential Fixed Investment (billions of 1982 dollars)	456.7	451.9	469.0	-1.0	3.8
7. New Private Housing Units Started (annual rate, millions)	1.81	1.73	1.66	-4.21 ²	-4.05 ²
8. Change in Business Inventories (billions of 1982 dollars)	6.6	17.0	20.6	10.4 ³	3.6 ³
9. Treasury Bill Rate (3-month, percent)	5.97	5.80	6.29	-0.17 ¹	0.49 ¹
10. Consumer Price Index (annual rate)	1.9	3.8	4.5	1.9 ¹	0.7 ¹

	Quarterly						Percent Change	
	1987 Q1 Actual	Q2	1987 Forecast			Q2 1988	Q1 87 to Q1 88	Q2 87 to Q2 88
			Q3	Q4	Q1 1988			
1. Gross National Product (\$ billions)	4339.2	4400.5	4480.0	4549.6	4631.5	4709.6	6.7	7.0
2. GNP Implicit Price Deflator (1982 = 100)	116.2	117.4	118.5	119.7	120.9	122.0	4.0	3.9
3. GNP in Constant Dollars (billions of 1982 dollars)	3735.2	3756.0	3780.6	3810.5	3835.5	3862.0	2.7	2.8
4. Unemployment Rate (percent)	6.7	6.6	6.5	6.5	6.4	6.5	-0.3 ¹	-0.1 ¹
5. Corporate Profits After Taxes (\$ billions)	145.0	143.2	145.0	146.0	151.0	155.3	4.1	8.4
6. Nonresidential Fixed Investment (billions of 1982 dollars)	442.4	450.0	453.7	458.9	461.5	466.5	4.3	3.7
7. New Private Housing Units Started (annual rate, millions)	1.81	1.71	1.70	1.69	1.66	1.68	-7.91 ²	-1.49 ²
8. Change in Business Inventories (billions of 1982 dollars)	31.0	12.0	13.5	10.0	18.0	20.0	-13.0 ³	8.0 ³
9. Treasury Bill Rate (3-month, percent)	5.53	5.71	5.95	6.00	6.17	6.30	0.64 ¹	0.59 ¹
10. Consumer Price Index (annual rate)	4.5	4.2	4.3	4.4	4.2	4.4	-0.2 ¹	0.2 ¹

SOURCE: National Bureau of Economic Research and American Statistical Association, Business Outlook Survey, June 1987. The figures on each line are medians of twenty-eight individual forecasts.

¹Change in rate, in percentage points.

²Possible discrepancies in percentage changes are caused by rounding.

³Change in billions of dollars.

The yield on new high-grade corporate bonds is also forecast to increase in each of the five quarters covered, from 9.0 percent in 1987:2 to 9.6 percent in 1988:2. The annual figures for 1987 and 1988 are about the same.

Three months ago the forecasts were slightly lower (6.1 percent for the bill rate and 9.2 percent for the bond yield, for example).

All but a few forecasters anticipate some increases in both inflation and interest rates. The ranges of the individual forecasts for 1988:2 are 5.5-7.5 percent for the bill rate and 8.6-11.4 percent for the bond yield.

Modest Gains in Production, Larger Gains in Profits

Output of manufacturing, mining, and utilities is ex-

pected to grow 2.3 percent in 1987, a great improvement from the stagnation in 1986 but still less than the predicted gain in real GNP. (The March survey was more optimistic than this current survey.) In 1988, industrial production will rise 3.1 percent, more than total output, according to both the new and the previous median forecasts. Individual forecasts differ but the averages suggest steady gains of about 3.6 percent a.r. per quarter through 1988:2.

Corporate profits after taxes (in current dollars) are expected to gain 5.8 percent in 1986-7 and 10.4 percent in 1987-8. These group forecasts include some large revisions from the previous survey, downward for this year and upward for the next. Taken with the output expectations, these projections imply large increases in profit margins, presumably caused in large measure by increases in import prices and related prices.

Consumption to Grow Slowly, Housing Weaker

Real consumption, a source of great strength in 1986 when it increased 4.1 percent, is expected on average to gain only 2.0 percent in 1987. (The March forecast was 2.2 percent.) Improvements to a rate of 2.5 percent are projected for both 1987:2-1988:2 and 1987-8.

According to the forecasters, residential fixed investment, in constant dollars, which rose 9.5 percent last year, should move up only 1.5 percent in 1987 and decline 4.1 percent in 1987:2-1988:2 and 0.9 percent in 1988. Housing starts are predicted to fall 4.2 percent in 1986-7 and 4.0 percent in 1987-8. These median forecasts represent substantial downward revisions from the previous survey.

Business Investment Down in 1987, Up in 1988

Nonresidential fixed investment in 1982 dollars is expected to decline 1.0 percent in 1987, about the same as in 1986. However, its average level in 1988 should be 3.8 percent higher than in 1987, a significant upturn. A similar gain is projected for 1987:2-1988:2. In this respect the current forecasts tend to be more optimistic than those produced by the group in the first quarter of 1987.

The median forecasts for inventory investment, in billions of 1982 dollars, are 17 for 1986-7 and 21 for 1987-8, similar to the corresponding figures in the previous survey.

Trade Deficits Significantly Lower

The deficits as measured by net exports of goods and services are predicted to be about 16 percent lower at mid-1988 than at mid-1987. A comparison of the averages for 1987 and 1988 yields a very similar result. These forecasts are not very different from their March counterparts. The expectation that trade deficits will decline is widely shared.

Assumptions

Ten respondents report that they assumed "little or no change" in tax policy. A few expect some increase in excise taxes, a few others larger rises in the tax burden. The quoted figures are 4-10 percent in 1987-8 and \$8-20 billion in 1988.

Most of the reporting forecasters see defense outlays as rising by 3-5 percent or less in both 1987 and 1988. Some even assume small declines, probably in real terms.

Numerical estimates of monetary growth in 1986-7 range from 6 percent to 14 percent for M1 (12 responses) and from 5 percent to 9 percent for M2 (16). The projections for 1987-8 vary in the 5-8 percent and 6-10 percent intervals for M1 and M2, respectively (based on 17 responses).

Most of the comments on the dollar state that it will continue soft, losing 8-15 percent in 1986-7 and 5-7 percent in 1987-8 (12); a few see the dollar steadying in the near future (3). Some assume that real exports will

grow "strongly" or by 6-10 percent in both 1987 and 1988; a few see the shrinkage of the trade deficit as a slow process.

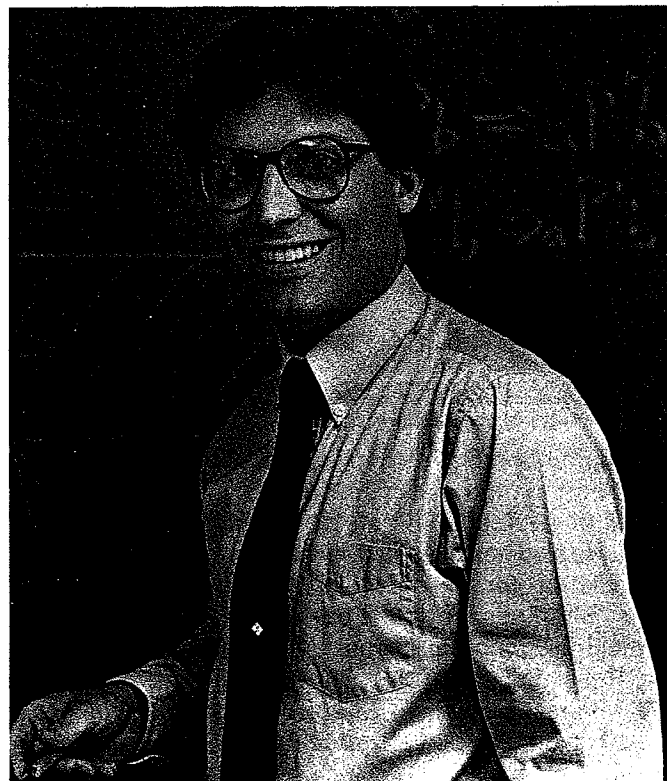
Stable energy demand and prices are assumed by several respondents. Oil prices are likely to stay in the \$16-20/barrel range in 1987 (14) and in the \$17-24/barrel range in 1988 (12).

This report summarizes a quarterly survey of predictions by 28 business, academic, and government economists who are professionally engaged in forecasting and are members of the Business and Economics Statistics Section of the American Statistical Association. Victor Zarnowitz of the Graduate School of Business of the University of Chicago and NBER, assisted by Robert E. Allison and Deborah A. Nicholson of NBER, was responsible for tabulating and evaluating this survey.

NBER Profiles

B. Douglas Bernheim

Doug Bernheim, a research associate in NBER's Program in Taxation, was recently named a tenured professor of economics at Stanford University. A California native, Bernheim received his A.B. from Harvard University in 1979 and his Ph.D. in economics from MIT in 1982. He joined the Stanford faculty in 1982 and has



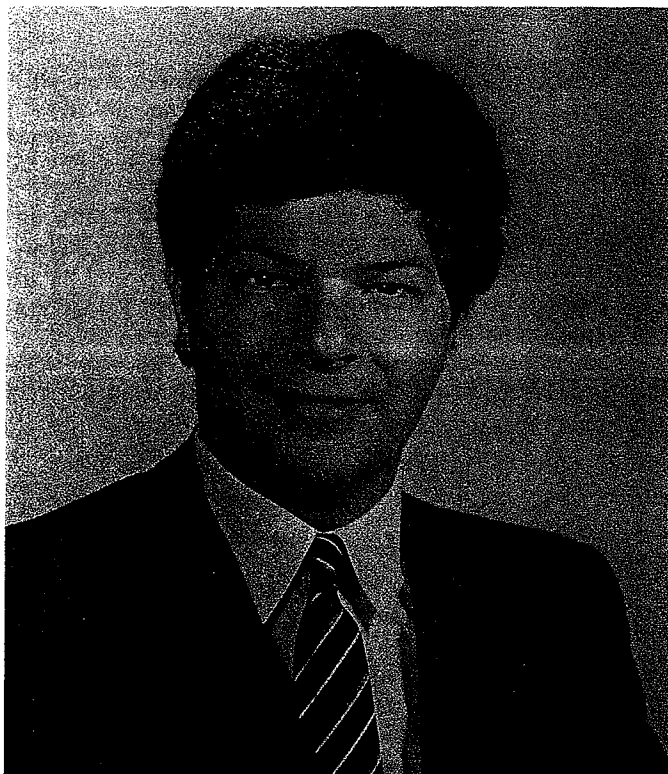
taught public finance and microeconomics there at the undergraduate and graduate levels.

Bernheim was an NBER Olin Fellow in 1985-6 and is currently an Alfred P. Sloan Foundation Research Fellow (through 1989). His articles have been published in the *Quarterly Journal of Economics*, the *American Economic Review*, the *Journal of Political Economy*, and other journals. He has also written on taxes, pensions, and retirement issues for a number of NBER books.

Doug and his wife, Debbie, live in Menlo Park with their two daughters, Melissa and Jennifer. His hobbies include gardening, cooking, jogging, and basketball.

Matthew D. Shapiro

Matthew Shapiro has been a faculty research fellow in NBER's Program in Financial Markets and Monetary Economics since 1985, and was an Olin Fellow at the Bureau during the 1986-7 academic year. He received his B.A. and M.A. from Yale University in 1979 and his Ph.D. from MIT in 1984.



Shapiro served as a junior staff economist at the Council of Economic Advisers in 1979-80 and was named an assistant professor in Yale's economics department in 1984. He also has been on the research staff of the Cowles Foundation for Research in Economics at Yale since 1984. Shapiro's work has been published in a number of leading economic journals as well as in NBER's Working Paper Series.

A Minneapolis native, Shapiro is single and resides in New Haven. He plays the cello and is an avid tennis player.

Conferences

Empirical Studies of Strategic Trade Policy

The Center for Economic Policy Research (CEPR) and NBER cosponsored a workshop on "Empirical Studies of Strategic Trade Policy" in London on January 30. The meeting was attended by officials from several UK government departments and from the European Commission, and academic economists from several European countries, as well as those participating in the research program. The following papers were discussed:

Andrew Caplin, NBER and Princeton University, and Kala Krishna, NBER and Harvard University, "Most Favored Nation (MFN) Status and the Structure of Tariffs"

Val Lambson, University of Wisconsin, Madison, and J. David Richardson, NBER and University of Wisconsin, Madison, "Tacit Collusion and Voluntary Restraint Agreements (VRAs) in the U.S. Auto Market"

Victor Norman, CEPR and Norwegian School of Economics and Business Administration, "Strategic Policies for Export Industries: Two Norwegian Examples"

Alasdair Smith, CEPR, and Anthony Venables, CEPR and University of Sussex, "Trade Policy under Imperfect Competition: Some Further Results"

Richard Baldwin, Columbia University, and Paul R. Krugman, NBER and MIT, "Market Access and International Competition" (NBER Working Paper No. 1936)

In the first paper, Caplin and Krishna analyze the role played by MFN status in the determination of tariff levels. They consider three possible models of tariff setting: noncooperative tariff setting, in which countries set tariffs without concern for their international repercussions; bilateral once-and-for-all negotiations over tariff levels; and a sequence of tariff bargaining sessions over time. In the first two models, Caplin and Krishna find that the introduction of MFN status leads to the setting of higher tariff levels. Only in the third model does an MFN clause tend to reduce tariffs, because it increases the incentives to make bilateral deals between the formal bargaining rounds.

Lambson and Richardson investigate the interaction between the VRAs and strategic behavior by firms in this market. They assume that automobile prices are

set by tacit collusion among firms that enforce such agreements by reducing their prices in the event of deviations from collusion. The importance of strategic behavior by firms in the model means that a VRA not only constrains sales but also firms' capacity and "threatened capacity."

This has two opposing effects on collusion. First, the VRA limits the ability to punish deviations from collusion: even if it reduces its price, a firm may not be able to increase its sales and punish other firms, which tends to work *against* collusion. By restricting the ability of Japanese firms to expand their sales, for example, the VRA increases the temptation to U.S. firms to abandon collusion and to initiate a price war to increase their market share, which tends to keep prices down. The second effect, on the other hand, works *for* collusion: firms find it less profitable to cheat on a collusive agreement. Although a firm may still deviate from the agreement by charging lower prices, the VRA limits its sales, and the lower price will not produce such a large increase in profits. This makes it more attractive to firms to abide by the agreement.

Lambson and Richardson argue that the tacit collusion model correctly predicts the industry-level profits and firms' capacity utilization levels but is less successful in explaining profits at the firm level. The theory, for example, predicts that among colluding firms, larger firms should have higher capacity utilization rates than smaller firms have. The data confirm this. The authors find no clear evidence that the VRA strengthens collusion among firms in the automobile industry. This contrasts with the findings of earlier studies.

Norman considers governments' use of strategic trade policy to change market conditions in order to transfer profits from foreign to home firms. He argues that such a policy may be impractical if the optimal strategy is sensitive to the specification of the market "game." Governments are unlikely to have the information necessary to choose the best policy. Norman focuses on the issues faced by the Norwegian government in the case of one export industry: Caribbean cruise shipping. Policies that reduce exporters' costs allow home country firms to compete more aggressively, but if the foreign firms do not reduce their capacity in response, the only beneficiaries would be the foreign consumers. If, however, foreign competitors react by reducing their capacity, the profits of the Norwegian firms rise. The firms themselves may be much better informed about which outcome is likely to occur than the government is, but they may have incentives not to reveal the true market structure to the government.

Smith and Venables present a quantitative partial equilibrium assessment of the effects of trade and industrial policy on the UK refrigerator industry. They assume that firms experience economies of scale in production and that the market is imperfectly competitive. They then choose values for the parameters of the theoretical model from a variety of sources so that the model's solutions are consistent with observed values of trade and production. Smith and Venables then sim-

ulate the effects of an import tariff, an export subsidy, and a production subsidy, for cases in which the number of firms and of the refrigerator models they produce are held constant, where only the number of firms is fixed, and where there is free entry of firms. Their tentative results suggest that these policy interventions will produce nontrivial gains for the domestic economy, although mostly at the expense of foreigners.

In the final paper of the workshop, Baldwin and Krugman investigate the impact of strategic trade policy in two industries, both of which are characterized by strong "learning" effects: the 16K RAM sector of the semiconductor industry between 1978 and 1983, and large commercial aircraft. Baldwin and Krugman simulate the impact of the apparent restriction on entry by U.S. producers into the Japanese market. This restriction allows Japanese producers to increase their production; the presence of *learning by doing* brings about falling production costs and helps the Japanese to capture 40 percent of the world market. However, Baldwin and Krugman's model indicates that the gains to Japanese producers from their increased market share were more than offset by the loss in consumer welfare caused by higher prices, since the Japanese producers seem to have been less efficient than those in the United States.

Baldwin and Krugman also study strategic aspects of the European Airbus project. They develop a model of competition between the Airbus Industrie and Boeing and simulate the behavior of the market with and without the Airbus. Their results imply that the Airbus project increased competition, which drove down the price of aircraft and permitted consumers to benefit from lower prices. This outweighed the implicit interest subsidy to the Airbus consortium provided by European governments.

This summary was prepared with the assistance of Alasdair Smith and Caroline Digby, both of CEPR.

Second Macro Conference Held

NBER's second Annual Conference on Macroeconomics was held in Cambridge on March 13-14. The conference, which drew more than 60 academic economists from throughout the United States, was organized by Stanley Fischer of NBER and MIT. The program was:

Chairman: Stanley Fischer

B. Douglas Bernheim, NBER and Stanford University, "Ricardian Equivalence: An Evaluation of Theory and Evidence"

Discussants: Marjorie A. Flavin, NBER and University of Virginia, and Charles I. Plosser, University of Rochester

Jeffrey A. Frankel, NBER and University of California, Berkeley, and Richard Meese, University of California, Berkeley, "Are Exchange Rates Excessively Variable?" (NBER Working Paper No. 2249)

Discussants: Robert P. Flood, Jr., NBER and Northwestern University, and Patrick Minford, University of Liverpool

Chairman: Christopher A. Sims, NBER and University of Minnesota

Paul M. Romer, NBER and University of Rochester, "Crazy Explanations for the Productivity Slowdown"

Discussants: Ben S. Bernanke, NBER and Princeton University, and Martin Baily, NBER and the Brookings Institution

Kemal Dervis, The World Bank, and Peter Petri, Brandeis University, "The Macroeconomics of Successful Development: What Are the Lessons?"

Discussants: Arnold C. Harberger, University of Chicago, and Miguel Urrutia, International Development Bank

Panel Discussion

Lawrence H. Summers, NBER and Harvard University, "The Scientific Illusions in Macroeconomics"

Discussants: Alan S. Blinder, NBER and Princeton University, Lars Peter Hansen, NBER and University of Chicago, and Bennett T. McCallum, NBER and Carnegie-Mellon University

Chairman: Martin Feldstein, NBER and Harvard University

Julio J. Rotemberg, NBER and MIT, "The New Keynesian Microfoundations"

Discussants: N. Gregory Mankiw, NBER and Harvard University, and Edward C. Prescott, University of Minnesota

Robert H. Topel and Kevin M. Murphy, NBER and University of Chicago, "The Evolution of Unemployment in the United States: 1968-1985"

Discussants: William T. Dickens, NBER and MIT, and David Lilien, University of California, Irvine

Bernheim considers whether government budget deficits make any difference: to national saving, to the interest rate, and to the balance of payments. The Ricardian equivalence hypothesis points out that an increased current deficit implies that taxes will have to be higher sometime in the future than they otherwise would be, in order to pay off the debt. People may anticipate these taxes by increasing their saving now in order to pay the future taxes. In its strongest form, the hypothesis holds that private saving will increase by exactly the same amount as the budget deficit; therefore, interest rates will be unaffected, and the current account likewise will not change. Bernheim concludes that deficits do matter. But the discussants' comments indicate that this conclusion is not shared by all.

Frankel and Meese ask whether exchange rates fluctuate excessively. Both the longer-term and day-to-

day movements in the exchange rate since 1973 appear to be larger than was anticipated then. Nonetheless, those fluctuations might be fully justified as rational responses to changes in the fundamental economic forces that should move the exchange rate. Frankel and Meese take a cautious approach: they say that, in the absence of successful models of exchange rate fundamentals, it is not possible to show conclusively that rates fluctuate excessively. After dismissing various tests and models as inconclusive, they use survey data on the expectations of market participants to uncover the process by which expectations are formed, and to decide whether independent movements in expectations may account for exchange rate movements. They conclude that rates probably have fluctuated excessively but caution that, even so, intervention by central banks will not necessarily succeed in stabilizing rates.

Romer examines the recent productivity slowdown in the United States in the context of the long-run growth of the economy. His main empirical finding is that capital formation appears to play the key role in determining growth over long periods, even though standard theories suggest that its role should be quite small. In seeking to explain why capital and investment might play such a role, Romer suggests that there are increasing returns to scale for the economy as a whole, even if not necessarily for the individual firms in the economy. The economy's stock of knowledge increases as individual firms invest and innovate. He also explores the role of increasing returns to scale when firms are not perfectly competitive. Romer shows that virtually all growth is accounted for by growth in the capital stock, and very little by increased labor inputs. Thus, an increase in employment contributes very little to faster growth, implying that average output per worker declines.

Dervis and Petri analyze growth in the developing countries. They begin by isolating 20 middle-income countries. They find that the fast growers invested more of their GNP, began with smaller governments, and expanded exports very rapidly. They did not have especially small government budget deficits, nor did they enjoy any unusual improvement in the terms of trade. For example, Korea has enjoyed extraordinary rates of growth for two decades, with time out mainly at the beginning of the 1980s. Turkey did reasonably well until the mid-1970s, then went into a deep crisis, and with the aid of foreign capital inflows, turned the situation around rapidly in the early 1980s. While both countries opened up significantly to trade, liberalizing imports and encouraging exports, the governments (particularly in Korea) did not take a *laissez-faire* approach. Also, capital markets were not seriously liberalized in either country. There was outward orientation, with an emphasis on the provision of appropriate price signals.

Rotemberg presents an evaluation of some recent work attempting to lay the microeconomic foundations of a Keynesian-type macroeconomic theory. In the last few years there has been an explosion of work on the new Keynesian microfoundations. Much of this work builds on the assumption that prices are costly to

change. This in itself is not an explanation of price stickiness and in particular invites the question of how such costs can possibly be large enough to produce recessions, which cost the economy billions and perhaps hundreds of billions of dollars in lost output. The key result is that small costs of changing prices for firms may be able to generate large business cycles.

Topel and Murphy analyze changes in the unemployment rate since the late 1960s. The underlying puzzle is why the "natural" or full employment rate of unemployment has risen, from about 4.5 percent in the late 1960s to an estimated 6.0 to 6.5 percent today. A frequent explanation for part of the change is that today's labor force has a higher proportion of groups with higher natural rates of unemployment. Topel and Murphy standardize for this factor by examining unemployment rates for males aged 18-64, a group whose labor force attachment is strong. They find that the rise in unemployment is very broadly based, not concentrated by industry, age, or schooling, although to some extent it is affected by geographic location. Most of the increase in total unemployment is accounted for by an increase in the frequency of very long spells of unemployment. Unemployment is more broadly based than it used to be, with the employed facing a greater probability of encountering unemployment than they used to. Finally, intersectorial labor mobility has declined as the unemployment rate has risen. Relative wages have not changed much, and real wages have been falling over much of the period since 1973.

These papers and their discussions will be published in *NBER Macroeconomics Annual 1987*, forthcoming from the M.I.T. Press. Its availability will be announced in a future issue of the *NBER Reporter*.

The Economics of Aging

NBER's Project on Aging sponsored a conference on "The Economics of Aging" on March 20-21 in New Orleans. Project Director David A. Wise, also of Harvard University, organized the program:

FINANCIAL STATUS AND EXPENDITURES

B. Douglas Bernheim, NBER and Stanford University, "The Timing of Retirement: Comparison of Expectations and Realizations"

Discussant: Edward P. Lazear, NBER and University of Chicago

Michael D. Hurd, NBER and SUNY at Stony Brook, and David A. Wise, "The Wealth and Poverty of Widows: Assets Before and After the Husband's Death"

Discussant: Robert W. Fogel, NBER and University of Chicago

Michael D. Hurd, "The Poverty of Widows: Future Prospects"

Discussant: David E. Bloom, NBER and Harvard University

LABOR FORCE PARTICIPATION AND RETIREMENT

Laurence J. Kotlikoff, NBER and Boston University, and David A. Wise, "Employee Retirement and a Firm's Pension Plan"

Discussant: Ariel Pakes, NBER and University of Wisconsin

Glenn Sueyoshi, MIT, "Social Security and the Determinants of Full and Partial Retirement: A Competing-Risks Analysis"

Discussant: Angus Deaton, NBER and Princeton University

John Rust, NBER and University of Wisconsin, and Richard Burkhauser, Vanderbilt University, "A Dynamic Programming Model of Retirement Behavior"

Discussant: Gary Burtless, Brookings Institution

HEALTH

John B. Shoven, NBER and Stanford University (with Jeffrey O. Sundberg and John P. Bunker), "The Social Security Cost of Smoking" (NBER Working Paper No. 2234)

Discussant: Paul J. Taubman, NBER and University of Pennsylvania

Alan M. Garber, NBER and Stanford University, "Long-Term Care, Wealth, and Health of the Disabled Elderly Living in the Community"

HOUSING, LIVING ARRANGEMENTS, AND FAMILY SUPPORT

Steven F. Venti, NBER and Dartmouth College, and David A. Wise, "Aging, Moving, and Housing Wealth"

Discussant: James M. Poterba, NBER and MIT

Konrad Stahl, Universität Dortmund, "Housing Patterns and Mobility of the Aged: The United States and West Germany"

Discussant: Henry Pollakowski, Harvard University

Axel Börsch-Supan, NBER and Harvard University, "Household Dissolution and the Choices of Alternative Living Arrangements among Elderly Americans"

Discussant: John M. Quigley, University of California, Berkeley

Daniel McFadden, NBER and MIT, and Jonathan Feinstein, MIT, "The Dynamics of Housing Demand by the Elderly: I. Wealth, Cash Flow, and Demographic Effects"

Discussant: Yannis Ioannides, NBER and Virginia Polytechnic Institute

Laurence J. Kotlikoff (with John Morris), "Childless and Abandoned Elderly: Some New Data on the Extended Family"

Discussant: David T. Ellwood, NBER and Harvard University

Bernheim uses data from the Social Security Admin-

istration's Retirement History Survey (RHS) to study expectations about the timing of retirement. He finds that individuals' forecasts of their own retirement dates are highly accurate. Individuals' expectations did not seem to be biased during periods in which Congress legislated large real increases in Social Security benefits. This suggests either that the benefit increases were anticipated, or that unanticipated changes in benefits have little effect on short-term plans for retirement.

Hurd and Wise verify that widows are much more likely than couples to be poor and that they make up a large proportion of the elderly poor: 80 percent are widows and other single individuals. Using the RHS, Hurd and Wise find that widows often become poor upon the death of the husband, even though, before his death, the married couple was not poor. While only 9 percent of married couples were poor, 35 percent of the surviving widows are poor. Clearly, a large proportion of the couple's wealth is lost when the husband dies.

Hurd and Wise also find that the households of poor widows both earned and saved less before the husband's death than did the households of widows who are not poor. Finally, household income often fell after the husband's death because there were no survivorship benefits nor life insurance.

Hurd goes on to estimate the fraction of widows who will become poor. His measure of poverty status is based on consumption, not income, since he believes that this is the appropriate measure of well-being for the elderly.

According to Hurd's projections, the fraction of widows in poverty should not increase substantially in the future. However, the differences between the consumption- and income-based measures of poverty are large. Even more important is the valuation put on Medicare/Medicaid: for two reasonable valuations of that health insurance, the fractions in poverty are very different.

Kotlikoff and Wise describe the provisions of the pension plan of a typical large corporation. The plan provides strong incentives to retire beginning at age 55. After age 65, negative pension accruals and negative Social Security accruals effectively impose a tax rate of almost 100 percent on wage earnings for many employees of the firm.

It is clear that these inducements to retire early have a substantial effect on rates of departure from the firm. The jumps in departure rates at specific ages coincide with the discontinuities and kink points in the worker compensation profiles, and with wage earnings profiles and Social Security accrual. The results suggest that the effects on labor force participation of increases in Social Security benefits are likely to be small relative to the effects of private pension provisions.

Empirical analyses of retirement behavior typically assume a single form of retirement. Sueyoshi, on the other hand, considers the determinants of full or partial retirement. Social Security affects the two forms of retirement in different ways: increases in benefits raise the probability of full retirement by more than the probability of partial retirement. Increases in the increment

to Social Security benefits from additional work lower the probability of partial retirement by more than that for full retirement. Sueyoshi's results indicate that the large increase in Social Security benefits in the early 1970s increased the probabilities of full retirement while lowering the probability of partial retirement.

Rust and Burkhauser formulate a model of retirement behavior in which the worker's objective is to maximize expected discounted utility over his remaining lifetime. At each time period, the worker chooses how much to consume and whether to work full time or part time, or to leave the labor force. The model accounts for the sequential nature of the retirement decision problem. It also considers the role of expectations of such uncertain future variables as: the worker's life span, health status, marital and family status, and employment status; and earnings from employment, assets, Social Security, disability, and Medicare payments.

Shoven and his coauthors examine the Social Security cost of smoking from an individual point of view. If smokers have a shorter life expectancy than nonsmokers have, then by smoking they are giving up potential Social Security benefits. Shoven and his coauthors estimate this cost and consider the effects of smoking on the system as a whole.

They use mortality rates for smokers and nonsmokers, and expected Social Security taxes and benefits for each group, using median earnings as a base. They find that smoking costs men about \$20,000 and women about \$10,000 in expected net benefits, and conclude that the prevalence of smoking has a direct effect on the financial viability of the Social Security system; every decrease in the number of smokers increases the system's liability. Therefore, changes in smoking behavior should be recognized as affecting the system.

Providing and financing long-term care of the elderly are among the most challenging policy issues facing the aging American population. Garber studies a group of noninstitutionalized, elderly Medicare recipients who are impaired in the performance of at least one basic activity. He asks how their wealth, living arrangements, and health affect their use of hospital services, paid home health care, and unreimbursed home care. He finds that the number of limitations on activity increases with age, but (in this population) household income and the value of home equity do not decrease with either the level of disability or with age. The determinants of home health care utilization in his sample are distinct from the factors that have been significant predictors of medical care utilization in other studies.

Venti and Wise study the relationship between family attributes and moving, and between moving and changes in housing wealth. Moving is often associated with retirement, the death of a spouse, or other changes in marital status. At the same time, median housing wealth increases as the elderly age. Even when the elderly move, their housing equity is as likely to increase as to decrease. So high transaction costs associated with moving are apparently not the cause of the stability in housing wealth as the elderly age. For whatever rea-

son, apparently homeowners have a considerable attachment to their homes. The absence of a well-developed market for reverse mortgages may be explained by a lack of demand for these financial instruments; the evidence suggests that the typical elderly family does not wish to reduce housing wealth to increase current consumption.

Stahl compares the elderly's household attributes, housing choices, and housing mobility patterns in the United States and West Germany and asks whether it is feasible and desirable for the government to provide incentives for reducing the housing consumption of the elderly to accommodate more of the younger households' growing demand for housing. He finds that in both countries, especially among the homeowners, the aged consume substantially more living space than their younger counterparts do. He also finds that the American elderly on average are more mobile than the Germans are, but the differences vary widely across households. He concludes that early retirement and reductions in rent differences between vacant and occupied housing stock will encourage a reduction in the elderly's consumption of housing.

Börsch-Supan also studies housing choices of the elderly. These include the choice between living in one household with their adult offspring, or sharing accommodations with other related or unrelated elderly. In contrast to young families who experienced a rapid increase in the proportion of alternative living arrangements in the early 1980s, for the elderly this proportion steadily decreased from 1974 to 1983. Börsch-Supan's main finding is that demographic determinants rather than economic variables predominate. The difference in income growth between the young and the elderly can explain only part of the discrepancy in household dissolution decisions; the balance is caused by the elderly's slow adaptation to new economic circumstances.

McFadden and Feinstein also investigate the pattern of housing mobility among the elderly. They focus on two issues: determining which household characteristics tend to increase the probability of a move; and whether elderly households systematically move to smaller, less expensive dwellings when they do move, and what makes such "downsizing" particularly likely. They find that wealthier households are less likely to move and to downsize, and that changes in family composition or retirement status significantly increase the likelihood of a move. They do not find much evidence of imperfections in the housing market, or of pervasive liquidity constraints.

Kotlikoff and Morris present findings from a new survey of extended families among the elderly of Massachusetts. The data suggest that while many of the elderly receive considerable attention from their children, a significant minority of them—many of whom need assistance with the activities of daily living—either have no children or receive no significant care or attention from their children. There appears to be less care and attention by children of these vulnerable elderly than between children and the nonvulnerable

elderly. The least amount of contact seems to be between children and the institutionalized elderly. In addition, although many of the parents are very poor, financial support from children to parents, other than in the form of shared housing, is uncommon.

The new data come from two sources: a Hebrew Rehabilitation Center panel survey of the elderly in Massachusetts and a Hebrew Rehabilitation Center-National Bureau of Economic Research survey of the children of these elderly. The children of the elderly were asked about their own economic situation and contact with their parents as well as about the economic situation and parental contact of each of their siblings.

In addition to the authors and discussants, Richard Suzman of the National Institute on Aging attended this conference.

Measurement of Saving, Investment, and Wealth

NBER's Conference on Research in Income and Wealth met in Baltimore on March 27-28 to discuss the measurement of saving, investment, and wealth. The program, organized by Robert E. Lipsey of NBER and Queens College and Helen Stone Tice of the Bureau of Economic Analysis (U.S. Department of Commerce), was:

Aggregate National and Sectorial Saving

SESSION I: National Income Account (NIA) and Flow-of-Funds (FOF) Account Saving Estimates

Chairman: Edward Denison, The Brookings Institution

Thomas M. Holloway, Bureau of Economic Analysis, "Present NIPA Saving Measures, Their Characteristics and Limitations"

Discussant: Paul Wachtel, NBER and New York University

John F. Wilson, James L. Freund, Fredrick D. Yohn, and Walter Lederer, Federal Reserve Board, "Household Saving Measurement: Recent Experience from the Flow-of-Funds Perspective"

Discussant: George M. von Furstenberg, Indiana University

Clark W. Reynolds, Stanford University, "NIA and FOF Saving Estimates in Latin American Countries"

Discussant: Nathaniel Leff, Columbia University

SESSION II: Expanded Measures of Saving and Investment

Chairman: Robert E. Gallman, NBER and University of North Carolina

Patric H. Hendershott, NBER and Ohio State University, and Joe Peek, Boston College and Federal Reserve Bank of Boston, "Private Saving in the United States: 1950-85" (NBER Working Paper No. 2294)

Discussant: Frank de Leeuw, U.S. Department of Commerce

Dale W. Jorgensen, Harvard University, and Barbara Fraumeni, Northeastern University, "The Accumulation of Human and Nonhuman Capital"

Discussant: Sherwin Rosen, NBER and University of Chicago

SESSION III: Sectorial Saving Measures—I

Chairman: Zoltan E. Kennessey, Board of Governors, Federal Reserve System

Michael J. Boskin, NBER and Stanford University, Marc S. Robinson, Stanford University and UCLA, and Alan Huber, Stanford University, "Government Capital Investment and Wealth"

Discussant: Robert Eisner, Northwestern University
Thomas K. Rymes, Carleton College, "On Banks and the Measurement of Sectorial Savings Relations"

Discussant: Anna J. Schwartz, NBER

SESSION IV: Sectorial Saving Measures—II

Chairman: Murray F. Foss, American Enterprise Institute

Stephen P. Taylor, Federal Reserve Board, "The United States and the World Current-Account Discrepancy"

Discussant: Michael Dooley, International Monetary Fund

Richard and Nancy Ruggles, Yale University, "Saving and Capital Formation of Enterprise Sectors: A Market Transactions View"

Discussant: Vito Natrella, Economic Consultant

Household Microdata on Saving and Wealth

SESSION V: New Household Microdata

Chairman: H. J. Adler, Statistics Canada

Enrique J. Lamas and John M. McNeil, U.S. Bureau of the Census, "Year-Apart Estimates of Household Net Worth from the Survey of Income and Program Participation"

Discussant: Martin David, University of Wisconsin
Richard Curtin, F. Thomas Juster, and James Morgan, Institute for Social Research, University of Michigan, "Survey Estimates of Wealth: An Assessment of Quality"

Discussant: Gene Smolensky, University of Wisconsin

SESSION VI: Life-Cycle Saving

Chairman: Edward C. Budd, Pennsylvania State University

Nancy A. Jianakopulos, Paul L. Menchik, and F. Owen Irvine, Michigan State University, "Using Panel Data to Assess the Bias in Cross-Sectional Inferences of Life-Cycle Changes in the Level and Composition of Household Wealth"

Discussant: B. K. Atrostic, U.S. Department of the Treasury

Daniel B. Radner, Social Security Administration, "The Wealth of the Aged and Nonaged, 1984"

Discussant: Marilyn Moon, American Association of Retired Persons

Steven G. Allen, NBER and North Carolina State University, Robert L. Clark and Ann McDermed, North Carolina State University, "Pension Wealth, Age-Wealth Profiles, and the Distribution of Net Worth"

Discussant: Cordelia Reimers, Hunter College

SESSION VII: Distribution of Wealth

Chairman: Harold Watts, Columbia University

Michael D. Hurd, NBER and SUNY, Stony Brook, and Gabriella Mundaca, SUNY, Stony Brook, "The Importance of Gifts and Inheritances among the Very Wealthy"

Discussant: Denis Kessler, Centre National de la Recherche Scientifique

Edward N. Wolff and Marcia Marley, New York University, "Long-Term Trends in U.S. Wealth Inequality: Methodological Issues and Results"

Discussant: Robert B. Avery, Board of Governors, Federal Reserve System

Aggregate National and Sectorial Saving

Holloway provides an overview of present National Income and Product Account (NIPA) saving measures and discusses the NIPA concepts and conventions that affect the measurement of saving. These include the scope of what is considered production, the sectoring of the economy, the attribution of pension funds to households, and imputations for nonmarket activities. He explains the effects of the comprehensive revision of the NIPA in 1985, describes some limitations of the official measures, and proposes several alternatives to them.

Wilson, Freund, Yohn, and Lederer review aspects of the flow-of-funds accounts (FFAs) that relate to the measurement of personal saving and suggest how to improve that measurement. Flow-of-funds estimates of personal saving tend to run higher than the NIPA estimates made and published by the Bureau of Economic Analysis. The authors identify certain areas of potential improvement in the capital account estimates, mostly in connection with potential reattributions of financial asset holdings toward sectors other than households. Some portion of the difference between NIPA and FFA saving estimates appears to reflect problems with the NIPAs because revisions to early NIPA data tend to bring the estimates closer together over time. There are also indications that personal income estimates associated with private pension funds may be too low.

Reynolds observes that flow-of-funds data have considerable potential for addressing the role of finance in savings mobilization and in gaining a better understanding of the sectorial distribution of savings. In particular, the Colombian FFA estimates show that the

level of household saving has been substantially underestimated in the NIPAs. This led to the preparation of integrated real and financial flow accounts; to higher, more reliable estimates of net household saving; and to a reduction to minimum levels of the discrepancy between real and financial accounts.

Hendershott and Peek develop and analyze adjusted saving measures that incorporate corrections for four measurement errors in the official statistics. They adjust the official NIPA personal saving series for the difference between income tax payments and actual liabilities, increase it to reflect saving via net purchases of government pension assets (including Social Security) and consumer durables, and decrease it by that part of aftertax interest income attributable to inflation. They also increase corporate saving by that part of aftertax interest expense attributable to inflation. The adjusted personal and private saving rates are only slightly below their post-1950 averages, not at all-time lows as reported in the official NIPA statistics. Furthermore, over the past 35 years, personal saving has been more volatile and corporate saving less volatile than the official measures. Finally, the inflation premium corrections remove the negative correlation between personal and corporate saving.

Jorgensen and Fraumeni present comparable measures of investment in human and nonhuman capital. They define human capital in terms of lifetime labor incomes for all individuals in the population. The measurement of investment in human capital is based on a system of demographic accounts. The measurement of investment in nonhuman capital is based on economic accounts for the accumulation of investment goods. Jorgensen and Fraumeni implement these concepts through a system of national accounts for the United States, covering 1948-84.

Boskin, Robinson, and Huber present revised estimates of various components of the government's contribution—positive or negative—to national wealth in the postwar period. They find that: (1) The share of national output devoted to private consumption has risen substantially, from 63 percent to 69 percent, over 1951-85. The national saving rate has fallen about four percentage points. (2) Federal government assets, tangible and financial, are substantial. Throughout the 1970s, they grew much more rapidly than the national debt did. By 1980, in constant 1985 dollars, federal government tangible assets were about \$1.9 trillion and financial assets \$940 billion compared to liabilities of \$1.5 trillion. However, since about 1980, conventional liabilities have grown much more rapidly than assets have, leading to a \$700 billion decline in the excess of assets over liabilities. (3) The state and local government sector contributes substantially to government and national wealth. State and local fixed reproducible capital are about twice that of the federal government, \$1.9 trillion in 1985 versus \$1.0 trillion. Total government reproducible capital amounts to 55 percent of the private nonresidential capital stock in 1985. Thus, government net investment often has been sufficient to turn the govern-

ment sector into a net saver despite large budget deficits.

Rymes considers simple general equilibrium theories of banking that suggest that monetary authorities: (1) tax the community by not following efficient monetary policies, or (2) provide the service, by themselves and indirectly through private banks, of the public good: monetary stability. Current imputation procedures suffer from an important defect: the failure to impute a different overall price level; this leads to measured banking output being understated and measured rates of saving in the personal and government sectors overstated.

Taylor notes that statistics on the world balance of payments experienced a severe degradation after 1979 and that, from 1982 on, the data inconsistencies across countries have resulted in world net imbalances on current account of as much as \$100 billion. In 1984 the IMF established a working party to study the problem, and Taylor summarizes the findings that resulted from their 1985-6 work. The focus was investment income accounts, in which the discrepancies had grown most dramatically after 1979. Recommendations in the working party report could reduce these imbalances for the sample year 1983 from a \$33 billion net debit to a \$6 billion debit. This would result from more systematic treatment of direct investment income and better measurement of interest-bearing asset positions for almost all countries. The working party report recommends comparable improvements for shipping and other transportation. Altogether the proposals reduce the imbalance to under \$30 billion outside the trade account, which has a small but volatile world discrepancy. U.S. estimates of investment income are severely understated, but the errors are on both sides of the account, and the U.S. component of the world imbalance is evidently small.

Richard and Nancy Ruggles investigate the empirical evidence on the saving and capital formation of different enterprise sectors. Household gross saving (excluding saving in pension funds) is only slightly greater than household gross capital formation, and the household sector is not a net supplier of funds to other sectors. Mining and manufacturing industries have tended to save in excess of their capital formation, while regulated industries and real estate have typically financed their capital formation by borrowing. Pension funds have been net lenders to other sectors.

Household Microdata on Saving and Wealth

Lamas and McNeil ask whether the Survey of Income and Program Participation (SIPP) provides useful measures of the relative net worth of various population subgroups and of year-to-year changes in net worth. They conclude that the periodic SIPP data on differentials in wealth holding among population groups are a useful addition to the stock of economic statistics, despite their limitations in coverage and underreporting. The underreporting problems mean that SIPP is not an appropriate source for measuring the concentration of wealth.

Curtin, Juster, and Morgan examine the three most recent surveys of household net worth and assess their quality and their potential usefulness for analysis. The three surveys examined are: the 1983 Survey of Consumer Finances (SCF), the 1984 Wealth Supplement to the Panel Study of Income Dynamics (PSID), and the 1984 Wealth Supplement to the SIPP. The authors examine five characteristics related to quality: the sample and questionnaire design; the derived distribution of wealth holdings, especially the upper tail; measurement errors; the incidence of item nonresponse and imputed values; and the comparison of survey estimates with independent information on national wealth. The authors conclude that the SCF, mainly because of its extensive oversampling of high-income households and the detail in which asset data were collected, is the most accurate and useful of the three. Furthermore, they suggest that where the asset totals calculated from the SCF differ from those attributed to the household sector in the FOF accounts on the BEA capital stock data, it is the SCF measures that are more likely to be correct.

Jianakoplos, Menchik, and Irvine assess the biases in cross-sectional inferences of life-cycle changes in the level and composition of household wealth. They compare age-wealth profiles based on five cross-sectional surveys of a panel with time-series age-wealth profiles for each of the 15 age cohorts from the same panel observed over 15 years. These comparisons confirm that productivity growth and differential mortality (the poor die young) cause substantial distortions in age-wealth profiles based on cross-sectional data and cause inferences about portfolio reallocations over time to be misleading. Furthermore, procedures used in previous research to adjust cross-sectional data for the productivity effect are unreliable and do not correct for the differential mortality effect.

Radner discusses wealth data requirements for the analysis of the economic status of households and presents selected estimates of wealth for 1984 from the SIPP. He emphasizes the economic resources available to households other than the very wealthy; his particular focus is on age groups, with a special interest in the aged. He then compares estimates of the age-wealth cross-sectional relationship for five household surveys and two synthetic estimates. Then, he presents detailed estimates from the 1984 SIPP. These tabulations illustrate several types of useful wealth estimates that can be made from household survey data.

Allen, Clark, and McDermed present the first evidence of pension wealth from the pension-provider component of the 1983 SCF. Their findings indicate that the expected present value of pension benefits represents a major component of household net worth. They show that median pension wealth, based on projected final earnings, for households with pensions is over \$30,000. This represents approximately 35 percent of median household net worth. Pension wealth rises with the age of household heads as the years until receipt of benefits decline. Pension wealth is primarily owned by households within the 25th and the 95th per-

centile of the nonpension wealth distribution. The inclusion of pension wealth in an analysis of wealth distribution tends to reduce the inequality of measured wealth. This paper provides new insights into the wealth distribution among U.S. households and the role of pensions in determining the relative net worth of families.

Hurd and Mundaca use data from the 1964 Survey of the Economic Behavior of the Affluent to estimate the fraction of household assets from inheritances and the fraction from gifts. These data are well suited for this calculation because the survey is heavily weighted to households with high incomes, and because the respondents were directly asked the fractions of assets from inheritances and from gifts. They estimate that 15–20 percent of household wealth came from inheritances and 5–10 percent from gifts. Even in households with very high incomes, very few people say that a large fraction of their assets was inherited or was given to them. According to the responses in this survey, it is not creditable that more than 50 percent of household assets came from gifts and inheritances. Data from the 1983 SCF with high-income supplement roughly confirm the results from the 1964 survey, although the results from the 1983 survey are much less comprehensive than those from the 1964 survey.

Wolff and Marley discuss some of the methodological issues involved in reconciling microdata and published data on household wealth distribution both with each other and with aggregate balance sheet data on household wealth. They find that the long-run record based on original sources shows a decline in wealth inequality in the United States from the early 1920s to the late 1940s, followed by relative stability in inequality, except for cyclical fluctuations. This mirrors very closely the time pattern for income inequality. The basic record holds up even after an adjustment and the use of consistent national balance sheet data. However, if Wolff and Marley include Social Security and pension wealth in the household portfolio, the results indicate a continuing decline in wealth inequality from the late 1940s to the present, because of the relative growth of retirement wealth. Second, they find that the estimates of the level of household wealth concentration are quite sensitive to the methods used in their construction and to the choice of wealth concept. For estate tax data, adjustments in the aggregate balance sheet data and the treatment of trust and pension funds make a difference of two to four percentage points of the share of the top percentile. Adjustments to survey data also can make a substantial difference in point estimates. However, the trend in wealth inequality remains very similar among different choices of adjustment procedures and of wealth concepts.

A conference volume including these papers and their discussions is forthcoming from the University of Chicago Press. Its availability will be announced in a future issue of the *NBER Reporter*.

International Economic Cooperation

An NBER conference on "International Economic Cooperation" brought together NBER research associates with more than a dozen individuals whose key positions in government and business have provided them with direct experience in the international cooperation of economic policy. The conference, organized by NBER President Martin Feldstein and held on April 3-5, focused on cooperation in four areas: macroeconomic policy; international debt; international trade; and international financial policies. For each topic, an NBER research associate prepared a nontechnical background paper; the discussion of each subject was launched by prepared statements from three or four speakers.

The authors and associated speakers for the four topics were:

Macroeconomic Policy

Background paper: Stanley Fischer, NBER and MIT

Prepared remarks:

- Michael Blumenthal, Chairman of Unisys; Former Secretary of the Treasury
- Charles Schultze, Director of Economics, the Brookings Institution; Former Chairman, Council of Economic Advisers
- Alan Greenspan, Chairman Designate of the Federal Reserve Board of Governors; Former Chairman, Council of Economic Advisers
- Helmut Schmidt, Publisher of *Die Zeit*; Former Chancellor of the Federal Republic of Germany

International Debt

Background paper: Jeffrey D. Sachs, NBER and Harvard University

Prepared remarks:

- Anthony Solomon, Chairman of S. G. Warburg; Former President of the Federal Reserve Bank of New York
- William Ogden, CEO, Continental Illinois Bank and Trust; Former CFO of Chase Manhattan Bank
- Eduardo Wiesner, International Monetary Fund; Former Minister of Finance of Colombia
- Tim McNamar, Chairman of Gulf Pacific; Former Deputy Secretary of the Treasury

International Trade Policies

Background paper: J. David Richardson, NBER and University of Wisconsin

Prepared remarks:

- Robert Strauss, Attorney; Former Special Trade Representative
- Michiko Kunihiro, Chief Cabinet Councilor on External Affairs (Japan); Former Minister Plenipotentiary at the Japanese Embassy in Washington
- Edmund Pratt, Chairman and CEO, Pfizer, Inc.; Cochairman of the Business Roundtable

International Financial Policies

Background paper: Richard C. Marston, NBER and University of Pennsylvania

Prepared remarks:

- Jacques Attali, Special Advisor to President Mitterrand of France
- Guido Carli, Senator of the Italian Republic; Former Governor of the Bank of Italy
- John Petty, CEO, Marine Midland Banks; Former Assistant Secretary for International Affairs, U.S. Department of the Treasury
- Robert Solomon, Guest Scholar at the Brookings Institution; Former Director of the Federal Reserve Board's Division of International Finance

Macroeconomic Policy

Blumenthal began by offering a prototype of the large, computer-age multinational firm of which his company, Unisys, is an example. He stressed that a revolution in technology and factor mobility has increased the need for international policy coordination, while making it more difficult at the same time.

Schultze pointed out that in practice economic policies often become ends in themselves, rather than the means to better economic performance. Coordination is often thwarted, a result that macroeconomic models would not predict.

Greenspan focused principally on the implications of highly developed international capital markets for exchange rate management. Any realistic effort to reduce the volatility of exchange rates must equalize the supplies of assets denominated in major currencies.

Schmidt spoke of the importance of strong U.S. economic and political leadership for the West and emphasized the dangers of isolation. Discussion centered on the costs and benefits of coordinated policies seeking to stabilize currency values. Participants agreed that the current stalemate over the U.S. budget deficit has reduced the scope for effective macroeconomic cooperation.

International Debt

Anthony Solomon opened the second session, addressing new developments in the LDC debt problem. Without adequate and steady growth in the industrialized countries, the resumption of growth in the LDCs and two-way resource flows will be impossible, and more debt moratoriums will occur.

Ogden described the policy response to the last five years of debtor problems. He stressed the need for political leadership in reformulating the roles of the debtor countries, multinational institutions, and commercial banks in dealing with the debt crisis.

Wiesner focused on Latin America's broad policy changes in response to domestic developments and the withdrawal of international liquidity. Structural adjustment programs, administered with moderation, comprise the correct long-term strategy for promoting growth.

McNamar identified four phases of the current debt challenge beginning in 1982 and lasting until 25 years from now. He was encouraged by the growth of securitization and use of alternative debt instruments. Aid to debtor countries from governments of industrialized countries also will be needed in the coming years but may not be forthcoming. The discussion centered on whether forgiveness can or should be an integral part of the solution to the debt problem. Participants expressed disappointment at the failure of the U.S. government to transform the ideas behind the Baker initiative into policy.

International Trade Policies

Strauss spoke about the trade negotiations of the past few years as well as the current U.S. trade situation. He expressed concern that Japan's inability to deal with U.S. trade issues has greatly eroded support within the United States for good trade policy. Nevertheless, he felt that the trade bill coming out of the Congress in the fall will be a reasonably responsible piece of legislation.

Kunihiro pointed out that international trade today is confronted with three major obstacles: inordinate trade imbalances; instability of exchange rates; and growing debts of developing countries. He felt concerned that the rhetoric aimed at Japanese exporters often assumes a tone of vengeance. Such responses may lead to policies that in the end will antagonize America's trading partners.

Pratt spoke of the efforts of the Business Roundtable in promoting free trade and supporting multilateral trade negotiations. Unfortunately, however, the United States has given up more than it has received in previous multilateral trade talks. Pratt was pleased that competitiveness issues will play a larger role in the Uruguay Round. In the discussion, the need for an international political consensus on trade issues was stressed. A number of participants felt that the Gephardt trade bill would be damaging. Several speakers pointed out that trade imbalances ultimately are a macroeconomic problem.

International Financial Policies

Attali felt that we have now reached the end of the era of floating exchange rates and that a target zone system should be adopted. First, we must design a system in which the political costs of breaking the rules are greater than the costs of changing the parameters. If target zones are to work, political leaders must place a high priority on maintaining them.

Carli recounted the way in which countries cooperated under the Bretton Woods system. He suggested that similar forms of cooperation may be appropriate today and that stimulative policies in Japan and Germany would not be enough to reduce the U.S. current account deficit.

Petty emphasized that adjustments to the exchange rate system and the degree of international capital mobility will lie at the intersection of politics and eco-

nomics. He discussed the need for national policymakers to endorse global economic policies.

Robert Solomon spoke about the Louvre exchange rate agreement, the practicality of target zones, and the importance of repercussion effects between developing and industrialized countries. He felt that the dollar would have to fall further if the United States is to pay back its net external debt. In the general discussion, many participants expressed pessimism about the ability of the industrialized countries to stabilize currency values effectively. Some argued that worldwide coordination of monetary policy is neither desirable nor practical.

Other participants at the conference were: William H. Branson, NBER and Princeton University; Geoffrey Carliner, NBER; Georges de Menil, Institute for Advanced Studies in the Social Sciences (Paris); Robert Erburu, CEO, Times-Mirror Company; Martin Feldstein, NBER and Harvard University; Earl Foell, *Christian Science Monitor*; Jacob A. Frenkel, NBER and IMF; Kenneth A. Froot, NBER and MIT, who assisted in the preparation of this article; David Gergen, *U.S. News & World Report*; Richard N. Rosett, Washington University and Chairman of NBER's Board of Directors; and Renato Ruggiero, Secretary General of the Ministry of Foreign Affairs (Italy).

The background papers, prepared remarks, and discussion, with an introduction by Martin Feldstein, will be published by the University of Chicago Press in an NBER conference volume. In addition, a brief Summary Report of the proceedings will be produced later this year. The availability of these two publications will be announced in a future issue of the *NBER Reporter*.

Conference on Fiscal Federalism

NBER sponsored a conference on fiscal federalism in New York on April 10-11. The program was:

Wallace E. Oates, University of Maryland, and John Wallis, NBER and University of Maryland, "Decentralization in the Public Sector: An Empirical Study of State and Local Government"

Discussant: James R. Hines, Jr., NBER and Princeton University

Robert P. Inman, NBER and University of Pennsylvania, "The Growth of Federal Grants"

Discussant: Thomas Romer, Carnegie-Mellon University

Charles R. Hulten, NBER and University of Maryland, and Robert Schwab, University of Maryland, "Income Originating in State and Local Governments"

Discussant: Helen F. Ladd, Duke University

Jeffrey S. Zax, NBER and Queens College, CUNY, "The Effects of Jurisdiction Types and Numbers on Local Public Finance"

Discussant: Alan J. Auerbach, NBER and University of Pennsylvania

Lawrence B. Lindsey, NBER and Harvard University, "State and Local Tax Deductibility under the New Tax Law"

Discussant: Daniel R. Feenberg, NBER

Douglas Holtz-Eakin, NBER and Columbia University, and Harvey S. Rosen, NBER and Princeton University, "Tax Deductibility and Municipal Budget Structure" (NBER Working Paper No. 2224)

Discussant: Ronald Fisher, Michigan State University

George R. Zodrow, Rice University, "Eliminating State and Local Tax Deductibility: A General Equilibrium Model of Revenue Effects"

Discussant: Don Fullerton, NBER and University of Virginia

Oates and Wallis examine the pattern of fiscal centralization that has evolved during the twentieth century. They use a variety of economic and historical factors to explain the development of an increasingly centralized state and local entity. They find that population size, urbanization, income, and the size of the agricultural sector all have been important determinants of fiscal centralization.

Inman considers the federalist fiscal structure of the United States, which has moved steadily toward increased centralization in the financing of government services and transfers. He uses two alternative hypotheses to try to explain this move to more centralized financing. The first—that aid is allocated to correct market failures in the local public economy, or to equalize the provision of meritorious public goods—mostly fails to explain the observed pattern of federal aid. There is an effort to equalize the provision of services across states, but the extent of equalization is modest at best. The second hypothesis—that aid is allocated to ease the fiscal pressure in the state-local sector *when*, and only *when*, it is in the political interest of Congress to do so—is supported by national data on the growth in state-local spending and the growth in federal aid from 1948 to 1985.

There are two striking breaks in the political structure of budgeting, though. In 1968-71, there was increasing decentralization in congressional decisionmaking; the consequence was a sharp increase in aid per capita. From 1981-5, there was strong centralization in budgeting; the consequence was a significant decrease in per capita aid. Whether the 1981-5 break reflects a new trend in the aid budget or was unique remains to be seen.

Hulten and Schwab develop a set of income and product accounts for the state and local sector that parallel the accounts in the private sector. In contrast to the National Income Accounts' measure of income originating in the state and local sector, which ignores the role of capital, their estimate includes the imputed user cost associated with the stock of public sector capital.

They show conceptually that the treatment of capital income is an important issue in a range of policy questions, including the tax reform debate and the design of intergovernmental grants. Their empirical results indicate that current National Income Accounting procedures dramatically underestimate the amount of income originating in the state and local sector; in recent years, this understatement is on the order of \$100 billion.

They also find that labor productivity (output per worker) grew at an average annual rate of 0.6 percent, even under an assumption that total factor productivity growth was zero; by contrast, the official government figures implicitly assume no growth in labor productivity. Finally, Hulten and Schwab find that the state and local sector is capital intensive: their results suggest that the capital-output ratio in the state and local sector is roughly one-third greater than in the private sector.

Zax investigates the effects of alternative local government structures on aggregate local public debt and expenditures. Larger governments may experience economies of scale in the production and distribution of local public goods, but smaller and more plentiful governments provide a greater variety of public goods. Zax demonstrates that aggregate shares of county debt and expenditures in total income are smaller in counties with more jurisdictions. He concludes that a complex system of local government, which relies on special school districts as well as municipalities, may provide local public services at less expense than a consolidated government consisting of systems of small municipalities.

The deductibility of state and local taxes, worth over \$30 billion in 1983, is a significant feature of fiscal federalism. However, what is less clear is how that deductibility influences the behavior of state and local governments. In his paper, Lindsey asks how deductibility affects the level of taxation and the type of tax used, and how changes in the value of deductibility caused by the Tax Reform Act of 1986 affect congressional votes on tax reform.

He finds that state and local taxes are affected significantly by the net-of-tax cost of raising revenue. As the price of raising personal taxes increases, there is a substantial degree of substitution of business for personal taxes. In states with high prices of taxation, sales taxes are the tax source of choice. Increased deductibility, which lowers the cost of raising revenue, causes substitution of income taxes for sales taxes. Analysis of congressional voting shows that the overall effect of tax reform on taxes paid in the state is significant. However, the impact of tax reform on the price of raising state and local revenue does not affect congressional votes.

Holtz-Eakin and Rosen investigate the effects of deductibility of local taxes on communities' budgetary decisions. They estimate the effect of changes in the tax price of local spending induced by deductibility on the mix between deductible and nondeductible revenue sources and expenditures. Tracking the fiscal behavior of 172 local governments from 1978 to 1980, they find that the tax price has a powerful effect on the use of deductible revenue sources but no statistically signifi-

cant effect on the use of nondeductible revenue sources. If deductibility were eliminated, there might be a substantial decline in local government spending, they conclude.

Recent proposals to eliminate or reduce federal deductibility of state and local taxes have sparked interest in the question of how federal revenue gains would be reduced by shifts in state and local taxation from formerly deductible personal taxes to still deductible business taxes. Zodrow analyzes this question in the context of the median voter model. His results suggest that between 20 and 80 percent of predicted federal revenue gains may be eliminated because of changes in the state and local revenue mix and related general equilibrium effects.

In addition to the authors and discussants, the conference was attended by: Charles L. Ballard, Michigan State University; Daphne Kenyon, Department of the Treasury; Laurence J. Kotlikoff, NBER and Boston University; Therese McGuire, SUNY, Stony Brook; and James M. Poterba, NBER and MIT.

Labor Markets and the Macroeconomy

Nearly 100 economists from the United States and Canada gathered in Cambridge on May 8-9 for an NBER-Universities Research Conference on "Labor Markets and the Macroeconomy." The program, organized by John M. Abowd of NBER and Princeton University, was:

Chairman: Orley C. Ashenfelter, NBER and Princeton University

Jane E. Mather, Dartmouth College, "In Search of Cyclical Wage Differentials"

Discussants: Charles C. Brown, NBER and University of Michigan, and John Kennan, University of Iowa

Michael Keane, Brown University, Robert Moffitt, NBER and Brown University, and David Runkle, Brown University, "Real Wages over the Business Cycle: Estimating the Impact of Heterogeneity with Microdata"

Discussants: Steven G. Allen, NBER and North Carolina State University, and Mark Bilts, NBER and University of Rochester

Christopher Ruhm, Boston University, "The Extent and Persistence of Unemployment Following Permanent Quits and Layoffs"

Discussants: Daniel S. Hamermesh, NBER and Michigan State University, and Walter Wessels, North Carolina State University

Chairman: John M. Abowd

Timothy Dunne, Mark Roberts, and Lawrence Samuelson, all of Pennsylvania State University, "Plant Turnover, Employment Growth, and Job Stability in the U.S. Manufacturing Sector 1963-1982"

Discussants: David Card, NBER and Princeton University, and Lori Gladstein Kletzer, Williams College

Michael R. Darby, NBER and U.S. Department of the Treasury, John C. Haltiwanger, Johns Hopkins University, and Mark W. Plant, Princeton University and University of California at Los Angeles, "The Ins and Outs of Unemployment: The Ins Win" (NBER Working Paper No. 1997)

Discussants: Thomas Kniepner, University of North Carolina at Chapel Hill, and Ruth Klinov, The World Bank

Thomas Coleman, SUNY at Stony Brook, "Unemployment Behavior: Evidence from the CPS Work Experience Survey"

Discussants: Alan Harrison, McMaster University, and Eskander Alvi, University of Arizona

Chairman: Joseph G. Altonji, NBER and Northwestern University

Wayne Vroman, The Urban Institute, "Union Wage Settlements, Incomes Policies, and Indexation"

Discussants: Ronald G. Ehrenberg, NBER and Cornell University, and Roger Kaufman, Smith College

George E. Johnson, NBER and University of Michigan, "On the Prediction of Turning Points in the Time Series of the Unemployment Rate"

Discussants: Stephen Nickell, Oxford University, and Carlos Santiago, Wayne State University

Russell Cooper, NBER and University of Iowa, "Optimal Labor Contracts, Imperfect Competition, and Underemployment Equilibria: A Framework for Analysis" (NBER Working Paper No. 2060)

Discussants: Dale T. Mortensen, Northwestern University, and Jon Strand, University of Oslo

Mather uses data on individuals from the Panel Study of Income Dynamics (PSID) for 1969-82 to describe the differences in the cyclical movements of real wages. She regresses real wage growth on ten individual characteristics, a measure of aggregate economic activity, and the interaction of this variable with the individual characteristics. These interaction terms identify differences in cyclical wage variability. There appears to be no difference between workers who change jobs and those who do not. Workers with more job tenure and education have less cyclically sensitive wages. There also appears to be little difference between union and nonunion workers.

Keane, Moffitt, and Runkle study the correlation between the business cycle and the real wage. They find that workers are more likely to lose their jobs during a recession if they have high wages. Particularly in the manufacturing sector, which has rigid wages, those with high permanent and transitory wages are more

likely to be laid off. The true effect of the business cycle on wages is still procyclical but is much smaller than previous estimates have suggested.

Ruhm uses the PSID to analyze the unemployment experiences of workers who have left their jobs. In earlier studies, differences in unemployment among groups of people who have left a job probably have been overstated for older workers, blue collar workers, and those with substantial job seniority, and underestimated for nonwhites. Significant unemployment typically occurs in the five years after a separation: an average of 14 weeks after quitting and 32 weeks after being laid off. The most unemployment, in weeks, occurs among people with lengthy unemployment experiences in the past. This is especially true after an involuntary termination: more than 86 percent are out of work for more than six months, and 54 percent are out of work for more than a year, in the five-year period that follows. Finally, although people who leave their jobs have slightly higher rates of future joblessness than a random individual who stays at a job, the difference is caused by individual differences, not by the fact of leaving.

Dunne, Roberts, and Samuelson use a newly created data set of U.S. manufacturing plants to study the fluctuations in labor demand that arise from the process of plant growth and turnover. The data set includes all U.S. manufacturing plants with more than five employees present in any of the last five Censuses of Manufactures (1963, 1967, 1972, 1977, and 1982). They find substantial job creation through plant openings and expansions in contracting industries and regions, and substantial job loss through plant closings and contractions in growing industries and regions. The primary difference between growing and declining industries or regions arises from differences in the rates of plant expansion and contraction, rather than plant births and closings. The turnover process is characterized by new plants entering, relatively young plants either expanding or failing, and older plants contracting but failing less often than younger plants. This contrasts with the common view that plant turnover is primarily the replacement of outdated plants by new plants with superior technology.

Dunne, Roberts, and Samuelson also examine the composition of manufacturing employment. In each census year, approximately 70 percent of employment can be attributed to employment that was present in previous years and 30 percent to the addition of new jobs. The proportion of stable jobs in a given cohort increases with the age of the cohort, indicating that jobs in younger plants are less likely to survive in any time period than jobs in older plants are.

Darby, Haltiwanger, and Plant analyze unemployment in terms of variations in the number and distribution of people who become unemployed and an individual's probability of leaving unemployment. They find that the change in the size and distribution of the inflow into unemployment is the primary determinant of the unemployment rate. Instead of falling at the beginning of a recession, the outflow rate rises (with a

lag) in response to the increased inflows that drive the recession. In contrast to normal unemployment, cyclical unemployment is concentrated in groups with low normal exit probabilities.

Every March the Current Population Survey (CPS) asks questions about unemployment during the previous year. In analyzing these data, Coleman finds that the incidence of unemployment, and heterogeneity in incidence, are more important than the duration of a spell for explaining unemployment during the year. He also finds inconsistencies between inferences drawn from the data on experience and those drawn from other data sets.

Vroman examines the determinants of union wage changes negotiated in U.S. manufacturing between 1958 and 1984 using a large, longitudinal data base of "major" bargaining agreements. The agreements were reached in 252 separate bargaining situations that affected 2.8 million production workers in 1978. He finds that the most important determinants of negotiated wage changes were the expected rate of price inflation, inflationary surprises (that is, deviations of actual inflation from expected inflation), and the size of key national wage agreements reached in the automobile and steel industries. The national unemployment rate, industry profit rates, and catch-up from unexpected inflation of the lagged contract also had significant but smaller effects. Income policies had a modest restraining effect on negotiated agreements that was not dissipated by unusually large settlements in negotiations reached after they ended.

Johnson tests the hypothesis prominently featured in pre-Keynesian explanations of business cycles that the probability of the occurrence of the end of an economic expansion is positively related to the length of that expansion. There is strong evidence for this type of relationship for contractions: they pretty much burn out on their own. But expansions are more complex. Those that end within three years are most likely terminated by negative monetary shocks. But if an expansion reaches its fourth year (in the absence of a major war), some sort of real disturbance that moves the economy into a recession is likely to occur within two or three years.

Cooper studies the macroeconomic properties of imperfectly competitive economies. He focuses on the coordination failures that might arise in these economies. He also evaluates the role of the labor market in producing these coordination failures and studies certain labor market policies, such as unemployment insurance and alternative compensation schemes.

Conference Calendar

Each *NBER Reporter* includes a calendar of upcoming conferences and other meetings that are of interest to large numbers of economists (especially in academia) or to smaller groups of economists concentrated in certain fields (such as labor, taxation, finance). The calendar is primarily intended to assist those who plan conferences and meetings, to avoid conflicts. **All activities listed should be considered to be "by invitation only," except where indicated otherwise in footnotes.**

Organizations wishing to have meetings listed in the Conference Calendar should send information, comparable to that given below, to Conference Calendar, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138. Please also provide a short (fewer than fifty words) description of the meetings for use in determining whether listings are appropriate for inclusion. The deadline for receipt of material to be included in the Fall 1987 issue of the *Reporter* is August 15. If you have any questions about procedures for submitting materials for the calendar, please call Kirsten Foss Davis at (617) 868-9163.

August 14, 1987

Issues in the Uruguay Round, NBER

August 17-20, 1987

Annual Meeting, American Statistical Association*

August 24-28, 1987

43rd Congress: Public Finance and Performances of Enterprises, International Institute of Public Finance

September 3-6, 1987

Annual National Conference, Atlantic Economic Society*

September 4-6, 1987

Employment Strategies, Enterprise Management, and Industrial Relations, Center for Economic Policy Research

September 9-12, 1987

18th Bi-Annual Conference, Center for International Research on Economic Tendency*

September 11-12, 1987

Conference on International Migration, NBER

September 21-23, 1987

Conference on Developing Country Debt Policy, NBER

September 29-October 2, 1987

Annual Meeting, International Monetary Fund

October 4-7, 1987

Annual Meeting, National Association of Business Economists*

October 16, 1987

Conference on International Migration, NBER

October 22-23, 1987

Economic Policy Panel, Center for Economic Policy Research

October 29-31, 1987

9th Annual Research Conference, Association for Public Policy Analysis and Management

November 6-7, 1987

Conference on Political Economy, NBER

November 8-11, 1987

80th Annual Conference, National Tax Association-Tax Institute of America*

November 12-13, 1987

Conference on Worldwide Tax Reform, Brookings Institution

November 13, 1987

Program Meeting: Economic Fluctuations, NBER

November 17, 1987

Tax Policy and the Economy, NBER

November 20-22, 1987

Conference, Carnegie-Mellon University-University of Rochester

November 22-24, 1987

Annual Meeting, Southern Economic Association*

December 3-4, 1987

Special Meeting of Brookings Panel on Economic Activity, Brookings Institution

December 3-4, 1987

Annual Conference, International Association of Business Forecasting*

December 4-5, 1987

Universities Research Conference on Risk and Financial Markets, NBER

March 1988

Effects of Taxation on Capital Formation, NBER

March 11-12, 1988

Annual Conference on Macroeconomics, NBER

April 21-24, 1988

The Economics of Aging, NBER

April 22-23, 1988

Public Policy Conference, Carnegie-Mellon University-University of Rochester

April 29-30, 1988

Universities Research Conference on International Studies, NBER

May 12-13, 1988

Income and Wealth: 50th Anniversary Conference, NBER

June 8-10, 1988

International Seminar on Macroeconomics, NBER

June 30-July 3, 1988

Annual Meeting, Western Economic Association*

*Open conference, subject to rules of the sponsoring organization.

*Open conference, subject to rules of the sponsoring organization.

August 8-11, 1988

Annual Meeting, American Statistical Association*

September 25-28, 1988

81st Annual Conference, National Tax Association-Tax Institute of America*

September 25-28, 1988

Annual Meeting, National Association of Business Economists*

November 20-22, 1988

Annual Meeting, Southern Economic Association*

December 2-3, 1988

Conference on Savings, NBER

August 14-17, 1989

Joint Statistical Meetings, American Statistical Association*

September 17-20, 1989

Annual Meeting, National Association of Business Economists*

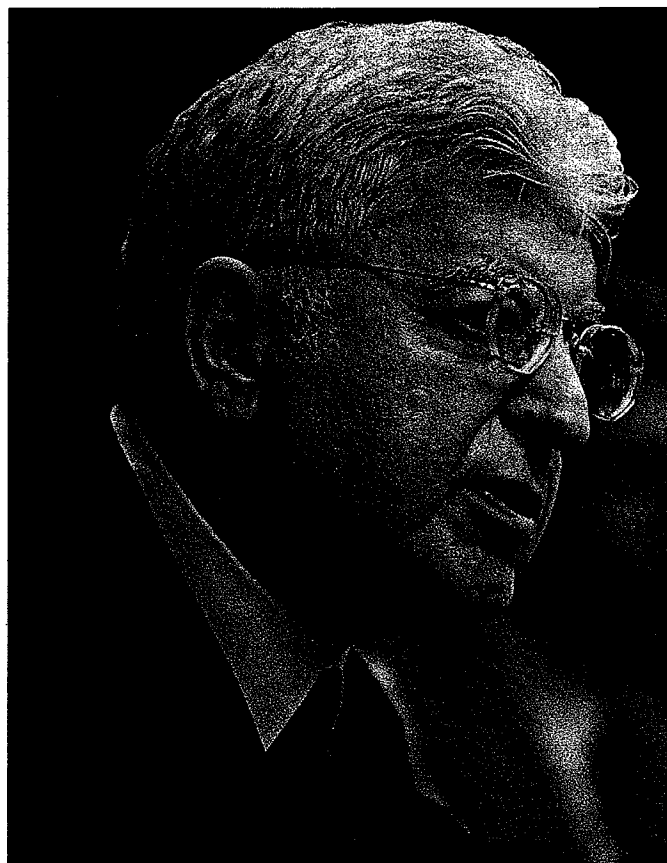
October 8-11, 1989

82nd Annual Conference, National Tax Association-Tax Institute of America*

November 19-21, 1989

Annual Meeting, Southern Economic Association*

**Open conference, subject to rules of the sponsoring organization.*



Burns Dead at 83

Arthur F. Burns, one of the major scholarly contributors to the National Bureau of Economic Research, died in June at the age of 83. Burns's affiliation with NBER began in 1930 when he became a research assistant in the Bureau's New York office while doing graduate work in economics at Columbia University. He was a member of the Bureau's research staff from 1933-69 and served as Director of Research from 1945-53, Bureau President from 1957-67, and Chairman from 1967-8. He was also a member of NBER's Board of Directors for more than 30 years and was an NBER Director Emeritus and Research Associate Emeritus at the time of his death.

Burns was born in Stanislau, Austria, in 1904. He received his A.B., A.M., and Ph.D. from Columbia University, where he was Professor of Economics from 1944-58 and Professor Emeritus after 1969. From 1927-44, Burns had taught at Rutgers University.

In addition to his distinguished academic career, Burns was a highly regarded public servant. He served as Chairman of the President's Council of Economic Advisers under Eisenhower in 1953-6, Chairman of the Federal Reserve Board of Governors from 1970-8, and U.S. Ambassador to the Federal Republic of Germany from 1981-5.

From 1978-81, and from 1985 until his death, Burns was a Distinguished Scholar in Residence at the American Enterprise Institute in Washington.

Burns is survived by Helen Bernstein, whom he married in 1930, and by their two sons, David and Joseph.

Heller Dead at 71

Walter W. Heller, former chairman of NBER during 1971-4 and 1981-3 and a member of the Board of Directors since 1960, died suddenly on June 15 at the age of 71.

Born in 1915 in Buffalo, NY, Heller received his A.B. from Oberlin College and his M.A. and Ph.D. from the University of Wisconsin. After completing his graduate studies, he worked at the U.S. Department of the Treasury during World War II and for the U.S. military government in Germany from 1947 to 1948. In 1946 Heller began teaching at the University of Minnesota, where he was chairman of the economics department from

1957 to 1961 and Regents Professor of Economics before becoming professor emeritus last year.

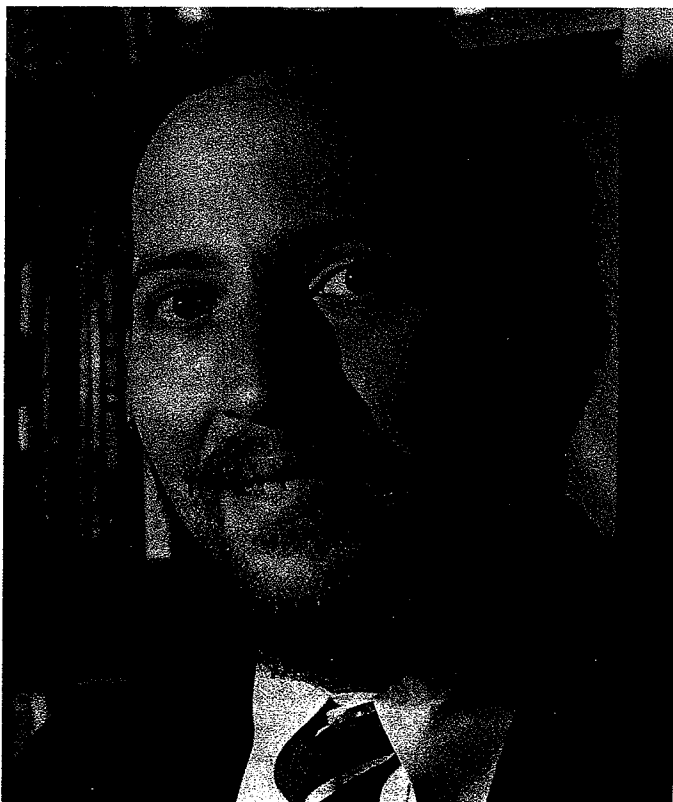
Heller served as chairman of the Council of Economic Advisers (CEA) under Presidents Kennedy and Johnson from 1961 to 1964. He was instrumental in introducing both presidents to Keynesian economics. Heller is often credited with persuading Kennedy to propose the 1963 tax cut and other policies that contributed to the expansion that lasted until the Vietnam buildup in the late 1960s.

Heller continued to advise President Johnson after leaving the CEA. He also served as a consultant to the United Nations, the U.S. Treasury, the Congressional Budget Office, the state of Minnesota, and other organizations. The author of numerous books and articles on economics, Heller was the recipient of several honorary degrees. He was also a Fellow of the American Philosophical Society and the American Academy of Arts and Sciences, and a Distinguished Fellow of the American Economic Association.

Heller will be missed by his many friends for his clear, forthright statements on economic issues and his perceptive advice. NBER benefited from his contributions over many years and owes much to his leadership.

Summers Receives NSF Prize

Lawrence H. Summers, a Research Associate in a number of NBER's programs and a Professor of Economics at Harvard University, is the first social scientist to win the National Science Foundation's Alan T. Waterman Award. The award, a grant of up to \$500,000 for



three years of research and advanced studies, is given annually to an outstanding young researcher in any field of science, mathematics, or engineering. Summers was chosen "... for his outstanding contributions to economic research on unemployment, taxation of capital, savings behavior, and macroeconomic activity. His work combines powerful analytic insights and imaginative econometric methods aimed at subjects of fundamental national importance," according to the NSF.

Summers received his B.S. degree at MIT in 1975 and his Ph.D. from Harvard University in 1982. He was named Professor of Economics at Harvard University in 1983. He recently served as editor of the 1987 NBER tax annual, *Tax Policy and the Economy*.

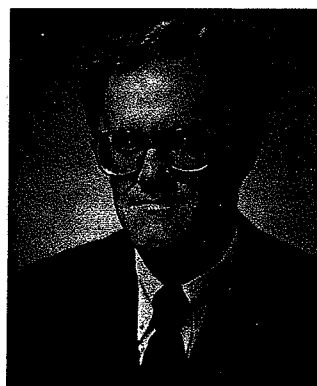
New Olin Fellows Named

The Bureau recently selected six Olin Fellows for 1987-8: Mark Bills, Alberto Giovannini, R. Glenn Hubbard, N. Gregory Mankiw, Peter C. Reiss, and Christina D. Romer. Olin Fellows spend one year at NBER's Cambridge office doing empirical research and are free of all teaching and university responsibilities during that year. The Fellows Program is made possible by a grant from the John M. Olin Foundation.

Bills teaches at the University of Rochester; he will examine pricing policies and economic fluctuations. Giovannini, who teaches at Columbia University, will study prices and exchange rates. Hubbard teaches at Northwestern University; his research topic will be financial markets. Mankiw teaches at Harvard University. He will analyze the relationships among consumption, interest rates, and economic fluctuations. Reiss, who is on the economics faculty at Stanford University, will study the economics of research and development. Romer teaches at Princeton University. She will analyze business cycles.

New Directors Named

Four new directors-at-large were elected to the NBER Board at its April meeting: John Herron Biggs, Kathleen B. Cooper, George C. Eads, and Paul W. McCracken.



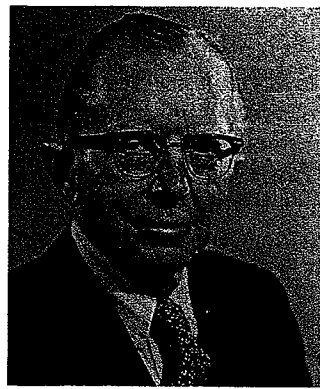
John Herron Biggs



Kathleen B. Cooper



George C. Eads



Paul W. McCracken

Biggs is President and Chief Executive Officer of Centerre Trust Company (St. Louis, MO). He holds an A.B. from Harvard University and a Ph.D. in economics from Washington University. From 1958-77, Biggs was associated with General American Life Insurance Company. From 1977-85, he was a Vice Chancellor at Washington University. He assumed his current position in 1985.

Cooper is Senior Vice President and Chief Economist of Security Pacific National Bank (Los Angeles). Before joining Security Pacific in 1981, she was Corporate Economist and then Chief Economist of the United Banks of Colorado (Denver). Cooper received her B.A. and M.A. from the University of Texas at Arlington and her Ph.D. in economics from the University of Colorado. She is also the immediate past president of the National Association of Business Economists.

Eads is Vice President and Chief Economist of General Motors Corporation. He received a B.A. from the University of Colorado and a Ph.D. in economics from Yale University. Eads has taught at Yale, Harvard, Princeton, and George Washington Universities. He was a member of the President's Council of Economic Advisers in 1979-81 and was a professor and the Dean of the School of Public Affairs at the University of Maryland from 1981 to 1986.

McCracken holds an A.B. from William Penn College and a Ph.D. in economics from Harvard University. He was a member of the faculty of the School of Business Administration at the University of Michigan from 1948 until his retirement in 1986. McCracken also chaired the President's Council of Economic Advisers from 1969-72.

Alex Kane, NBER and Boston University, and Stephen Marks, Boston University, "The Measurement of Market Timing Ability" and "Market Structure and the Optimal Dissemination of Information in the Financial Industry"

Discussant: Bruce N. Lehmann, NBER and Columbia University

Terry A. Marsh, NBER and Stanford University, and Robert C. Merton, NBER and MIT, "Corporate Dividend Dynamics at the Firm Level"

Discussant: Kenneth D. West, NBER and Princeton University

Alberto Alesina, NBER and Carnegie-Mellon University, and Guido Tabellini, Stanford University, "A Positive Theory of Fiscal Deficits and Government Debt in a Democracy"

Discussant: Herschel I. Grossman, NBER and Brown University

Ben S. Bernanke, NBER and Brown University, and Mark Gertler, NBER and University of Wisconsin, "Financial Fragility and Economic Performance"

Discussant: N. Gregory Mankiw, NBER and Harvard University

Robert J. Barro, NBER and University of Rochester, "Interest Rate Smoothing"

Discussant: Bennett T. McCallum, NBER and Carnegie-Mellon University

Kane and Marks evaluate the "Sharpe" measure of performance for a portfolio managed by someone engaged in attempting to add value by market timing decisions. They explore the case of a "market timer" with superior information, developing the exact conditions under which the Sharpe measure will completely and correctly order market timers according to their ability. Using the results of empirical estimates of market conditions reported by Merton (1980), they then find that the conditions for failure of the Sharpe measure in fact do occur. They perform the same analysis for the "Jensen" measure of market timing ability and find that it is more robust to market conditions.

In their second paper, Kane and Marks examine the dissemination of market timing information (signals on the overall performance of risky assets relative to the risk-free rate) and its effect on the structural organization of financial markets. Specifically, they investigate two market structures: in one, portfolio managers set up funds to take advantage of their information on market timing by actual trading; in the other, market timers sell their information through newsletters. The authors find that both market structures produce the same result. With restrictions on borrowing, the newsletter market structure is superior. This is one possible explanation for the plethora of market timing newsletters and the paucity of market timing funds.

Marsh and Merton find that, on average across firms, annual dividend changes can be predicted about as well by prior year changes in "permanent earnings," measured by stock price changes, as they can by con-

Financial Economists Meet

About 50 members and guests of NBER's Program in Financial Markets and Monetary Economics met in Cambridge on February 27. The agenda was:

temporaneous changes in accounting earnings. However, accounting earnings changes do add significantly to permanent earnings changes in explaining dividend movements for approximately 20 percent of the countries in their sample. Firms' dividend responses to marketwide and firm-specific components of their prior-year stock price changes are comparable. Dividend changes respond approximately in proportion to the unexpected component of contemporaneous changes in aggregate corporate dividends.

Alesina and Tabellini consider an economy in which policymakers with different preferences concerning fiscal policy alternate in office as a result of democratic elections. Government debt becomes a strategic variable used by policymakers to influence the choices of their successors. In particular, if different policymakers disagree about the desired composition of government spending between two different kinds of government-provided goods, the economy exhibits a bias toward budget deficits. Debt accumulation is higher than it would be with a social planner who worked out these conflicts internally. The equilibrium level of government debt is larger as the degree of polarization between alternating governments becomes larger, and the more likely it is that the current government will not be reelected. This paper has empirical implications that help to explain the current fiscal policies in the United States and in several other countries.

Bernanke and Gertler analyze the link between financial variables, such as firms' balance sheet positions, and the determination of investment spending. They develop a model of the process of investment finance in which there is asymmetric information between borrowers and potential lenders about the quality of investment projects. After deriving the optimal form of the financial contract between borrowers and lenders, they show that the cost of external investment finance rises as the borrower's balance sheet position deteriorates (his net worth falls). The authors characterize as "financially fragile" a situation in which balance sheets are sufficiently weak that the economy experiences substantial underinvestment, or possibly even a complete investment collapse. From the policy point of view, they show that "bailouts" of insolvent borrowers by the government may be a reasonable alternative in periods of extreme fragility.

Barro develops a model in which targeting the nominal interest rate is a reasonable guide for monetary policy. He takes expected real interest rates and output to be exogenous with respect to monetary variables, so that the central bank can influence nominal interest rates only by altering expected inflation. In each period, the monetary authority can come arbitrarily close to its (time-varying) target for the nominal interest rate, even while holding down the forecast variance of the price level. The latter objective pins down the extent of monetary accommodation to offsetting shifts in the demand for money and other shocks and thereby determines the levels of money and prices at each date. Empirical evidence for the United States

in the post-World War II period suggests that the model's predictions accord reasonably well with observed behavior for nominal interest rates, growth rates of the monetary base, and rates of inflation. Earlier periods, especially before World War I, provide an interesting contrast because smoothing of interest rates did not apply then. The behavior of the monetary base and the price level at these times differed from the post-World War II experience in ways predicted by the theory.

Program Meeting on Productivity

On March 20-21, about 40 members and guests of NBER's Program in Productivity attended a meeting in Cambridge. The agenda was:

Ian Domowitz and R. Glenn Hubbard, NBER, and Bruce C. Petersen, all of Northwestern University, "Market Structure and Cyclical Fluctuations in U.S. Manufacturing" (NBER Working Paper No. 2115)

Timothy F. Bresnahan, NBER and Stanford University, and Valerie Y. Suslow, University of Michigan, "Dynamic Demand and Market Power over the Business Cycle"

Matthew D. Shapiro, NBER and Yale University, "Measuring Market Power in U.S. Industry"

Thomas Abbott, Bureau of the Census, Zvi Griliches, NBER and Harvard University, and Jerry A. Hausman, NBER and MIT, "Productivity at the Plant Level"

W. Erwin Diewert, NBER and University of British Columbia, and Catherine J. Morrison, NBER and Tufts University, "New Techniques for the Measurement of Multifactor Productivity"

Jeffrey I. Bernstein, NBER and Carleton College, and M. Ishaq Nadiri, NBER and New York University, "R and D and Intraindustry Spillovers: An Empirical Application of Dynamic Duality" (NBER Working Paper No. 2002)

Marvin Lieberman, Stanford University, "Patents, Learning by Doing, and Market Structure in the Chemical Processing Industries"

Kim B. Clark, NBER, and Bruce Chew, both of Harvard University, "New Sources of Plant Microdata"

The theme for the first day's sessions was market power and the cyclicity of prices. The paper by Domowitz, Hubbard, and Petersen expands recent work on the importance of market structure for understanding cyclical fluctuations. The authors estimate industry markups of price over cost, and the influence of

market structure on cyclical movements in total factor productivity, for two-digit level industries. They find that price does exceed marginal cost in U.S. manufacturing, and that industry concentration is important in explaining this markup in durable and consumer goods. The effect of unionization is important for almost all industry groups, as are fixed costs related to labor, advertising, and central office expenses.

Bresnahan and Suslow study market power over the business cycle for the primary aluminum industry. They estimate the supply relationship for the industry, taking into account the medium-term fixity of the capital stock. Embodied in this capital stock are both capacity constraints and the short-run input demands for labor, materials, and energy. The authors find that industry price has been substantially above the marginal cost in the cyclical troughs; this can be attributed to market power in the industry. Market power thus provides part of the empirical explanation for strongly procyclical employment, capacity utilization, and output. Further, market power has been declining over time, because of both domestic and worldwide decreases in concentration. Therefore, price now can fall much closer to cost in the troughs of business cycles.

Shapiro also expands on recent work incorporating the importance of market structure for measures of productivity: he considers the relationship between markups and market power. He essentially finds no price-cost markups in agriculture, construction, and services, and very large markups in mining, transportation, communications and utilities, and trade. Shapiro also estimates the market elasticities and develops a measure of noncompetitive conduct based on the ratio of the firm markups to market elasticity. He finds that estimated measures of market power correspond to a wide range of conduct, with tobacco, chemicals, and paper industries close to the monopoly outcome.

Diewert and Morrison consider refinements to productivity growth measures for three types of changes: in capacity utilization; in the terms of trade among countries; and for imperfect competition in output markets. They find the third factor to be the most important for interpreting patterns of productivity growth. They also find that traditional productivity growth estimates have tended to be biased downward and that fluctuations and downward time trends have been exacerbated. Nevertheless, these results do not explain the large fluctuations in productivity growth because the adjustments are small compared to these fluctuations.

Abbott and Griliches reported on various research projects being conducted on productivity at the plant level.

The theme for the second day of the meeting was spillovers of technical and production knowledge. Bernstein and Nadiri estimate a model with intraindustry R and D spillovers and look at the effects of such spillovers on production and investment. In the four industries they analyze—chemical, petroleum, machinery, and instruments—they find that the spillover decreases the rate of R and D investment. Bernstein and Nadiri also

estimate the difference between the social and the private returns to R and D capital and find that the social return exceeds the private return in each industry.

Lieberman studies the propensity to patent and the link between patented process innovations and output prices for a sample of 24 chemical products. He distinguishes between three groups of patentees: U.S. producers of each product; U.S. nonproducers; and foreign firms (including both producers and nonproducers). The results show that patent activity is positively related to "learning by doing" as measured by the growth in cumulative output and market size. The effects of concentration vary by the type of patentee.

In the final paper of the meeting, Clark and Chew discuss their work in collecting plant-level microdata, and the possibilities for future research in collecting and using that data. Many questions that cannot be answered with more aggregated data can be addressed by this line of research.

In addition to the authors, participants at the meeting included: Angelo Cardani, Bocconi University; Paul David and Sarah Lane, Stanford University; M. Therese Flaherty and Adam B. Jaffe, NBER and Harvard University; Robert J. Gordon, NBER and Northwestern University; Wayne B. Gray, NBER and Clark University; Bronwyn H. Hall and Michael Whinston, NBER; Charles R. Hulten and Ingmar R. Prucha, NBER and University of Maryland; Paul Joskow and Richard Schmalensee, MIT; Edward Kokkelenberg, SUNY, Binghamton; Pierre Lasserre and Pierre Ouellette, University of Montreal; Jonathan S. Leonard, NBER and University of California, Berkeley; Frank R. Lichtenberg, NBER and Bureau of the Census; Robert S. Pindyck, NBER and MIT; Mark Schankerman and Edward N. Wolff, NBER and New York University; Fabio Schianterelli, Essex University; and Robin Sickles, NBER and Rice University.

Tax Economists Gather in Cambridge

Members and guests of NBER's Program in Taxation met in Cambridge on March 26–27 to discuss recent research. The agenda, arranged by Program Director David F. Bradford of NBER and Princeton University, was:

Daniel R. Feenberg, NBER, and Harvey S. Rosen, NBER and Princeton University, "Promises, Promises: The States' Experience with Income Tax Indexing"
Discussant: Lawrence B. Lindsey, NBER and Harvard University

John C. Haltiwanger, Johns Hopkins University, and Marc S. Robinson, General Motors Research Laboratories, "The Effect of Taxes on Inventories"

Discussant: Alan J. Auerbach, NBER and University of Pennsylvania

R. Glenn Hubbard, NBER and Northwestern University (joint work with Kenneth Judd), "Finite Lifetimes, Borrowing Constraints, and Short-Run Fiscal Policy" (NBER Working Paper No. 2158)

Discussant: Jonathan S. Skinner, NBER and University of Virginia

Martin Feldstein, NBER and Harvard University, "Imputing Corporate Tax Liabilities to Individual Taxpayers"

Discussant: Daniel Frisch, NBER and U.S. Department of the Treasury

Douglas Holtz-Eakin, NBER and Columbia University, "The Effect of the Line-Item Veto on State Budgets"

Discussant: Charles T. Clotfelter, NBER and Duke University

Robert S. Chirinko, NBER and University of Chicago, "Will 'The' Neoclassical Theory of Investment Please Rise?: The General Structure of Investment Models and Their Implications for Tax Policy"

Discussant: Roger Hall Gordon, NBER and University of Michigan

Jerry A. Hausman and James M. Poterba, both of NBER and MIT, "Household Behavior and the Tax Reform Act of 1986" (NBER Working Paper No. 2120)

Discussant: Don Fullerton, NBER and University of Virginia

Between 1978 and 1984, ten states made a commitment to indexing some component of their personal income tax systems; seven of the ten reneged on their commitments. Feenberg and Rosen first describe the various indexing statutes that were enacted and then construct a model to explain indexing. They find that the decisions both to index and to renege depend on the form of the state's tax structure and on the state's debt per capita.

Haltiwanger and Robinson study the interaction between taxes and inventories. Since corporate tax rates have changed little over the last 20 years, inventory accounting rules must be the source of most of the difference in inventory tax incentives. Building on results in the accounting literature, Haltiwanger and Robinson show that firms using the LIFO accounting method should hold higher levels of inventories over the entire business cycle than firms using FIFO. Analysis of annual data on individual firms over 1969-82 support this hypothesis. The inventories of firms using LIFO also appear to be less responsive to sales fluctuations and somewhat more sensitive to financial holding costs.

In their paper, Hubbard and Judd argue that theoretical and empirical emphasis on the importance of finite planning horizons for the analysis of many fiscal policies is misplaced. Most studies of the role of finite horizons in determining the effects of short-run fiscal policies on consumption have assumed perfect capital

markets. Hubbard and Judd show that while the marginal propensity to consume (MPC) out of temporary tax changes is not zero in finite-horizon models, it is very small. However, the MPC is quite sensitive to restrictions on borrowing. Shifting the emphasis from the length of the planning horizon to the structure of capital markets is an important step for empirical research.

Feldstein presents a method of studying the distributional consequences of changes in corporate taxes: by imputing the net effect of changes in effective corporate tax rates to individual tax returns. Applying this method to the tax changes enacted in 1986 shows that the actual distribution of the total tax change was very different from the distribution of the change in the personal income tax only. The net imputed corporate tax increase was equivalent to a rise of ten percentage points in the personal income tax for taxpayers with 1988 incomes over \$200,000 and six percentage points for taxpayers with incomes between \$100,000 and \$200,000. The corporate income tax increase also added the equivalent of a 10 percent rise in the income tax for taxpayers with incomes between \$10,000 and \$20,000. By contrast, for middle-income taxpayers (with incomes between \$30,000 and \$75,000) the corporate tax increase was equivalent to an income tax rise of only 2 or 3 percent. Feldstein also finds that the higher corporate tax represents a particularly large increase for taxpayers over the age of 65.

Forty-three of the 50 U.S. governors are empowered to veto state budget items on a line-by-line basis. Holtz-Eakin uses data on 48 states for 1967-83 to determine whether line-item veto power has significantly affected tax and nontax revenue and current and capital spending. He finds that the effect of the line-item veto is sensitive to the political party composition of states' legislatures and governorships. Growth of tax collections per capita is significantly lower (0.8 percent) under Republican governors with a line-item veto than under others. Similarly, the growth rate of current expenditures is roughly 1 percent lower when governors are capable of sustaining an item veto in the face of a legislature dominated by the opposition's party. These results suggest that a presidential line-item veto may reduce federal budget growth, but only in a quite limited set of circumstances.

Chirinko studies models of business fixed investment and develops a general neoclassical theory of investment/factor demands to interpret these models. The models are differentiated by the dynamics arising from expectations and by the technology (lags and adjustment costs). Chirinko concludes that the aggregate response of business investment to tax policy is quite low.

Hausman and Poterba ask how individual taxpayers are likely to respond to 1986 tax changes. Using NBER's TAXSIM model, they estimate that changes in the personal exemption and the earned income credit will remove 6 million households from the tax rolls by 1988. Of the 107 million remaining taxpayers, only 11 percent will face marginal tax rates that are more than ten per-