The Contributions of James M. Poterba

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Abstract

James Poterba has made important contributions to the economics of taxation and public finance more broadly. Beginning with studies of taxation in the contexts of corporate finance and aggregate saving, his work evolved to consider microeconomic applications in demography and population ageing, tax incentives for retirement saving, portfolio choice, annuitization, housing, and state and local fiscal policy. His work illuminates the markets and contexts where taxes do and do not matter empirically for economic outcomes. Poterba's scholarship is published in a range of outlets, including top-tier general interest journals, field journals, and venues serving audiences of non-specialists and policy makers. Throughout his career, he has taken on leadership roles to support students and faculty at MIT as well as the profession as a whole through the National Bureau of Economic Research.

Keywords

Taxation; finance; saving; fiscal policy; ageing; demographics.

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1 Introduction[1]

It is an honour to have been asked to write this chapter on Jim Poterba. I met Jim in the spring of my final year in college when I was applying to graduate school. He invited my Harvard undergraduate classmate, Chad Jones, and me to the department at MIT to have lunch and to meet some of his colleagues. It was Jim's first year as graduate recruiting chair; he made a compelling case to choose MIT; I met (at least) two future Nobel laureates on the faculty; and I matriculated in the fall of that year with Chad and many splendid classmates.

My enduring image of Jim is optimism and enthusiasm about the study and practice of public finance. When I visualise that image, he is standing at the front of a classroom in building E51 at MIT; it is the fall of my first year in graduate school; and the class is 14.471, the first semester of the public finance sequence. He is holding a piece of chalk and there are visible signs of chalk dust on him, but less than would be expected from how much action that chalk has seen. Jim has been asked a question that seems tangential to the most recent contact between the chalk and the chalkboard. Despite this, he is good natured enough to indulge the question and speaks uncommonly fast,[2] and so the digression takes only a bit of time. The digression includes a nearly encyclopaedic treatment of the relevant prior literature and always ends with suggestions about how an ambitious graduate student might contribute to that literature. Just before the chalk

[1] I thank Kelly Shin for research assistance.

[2] It has been conjectured that tangential questions were asked in this course altruistically, as a means of allowing one's classmates to catch up on their note-taking while the question unrelated to the material was being answered.

regains its proximity to the chalkboard, we hear the refrain, ‘The field is wide open’.

To Jim, the field was always wide open. If it seemed closed, the remedy was surely some combination of new data and methods, brought to life by the student’s curiosity and industry. Quoting his response to the question, ‘What is the future of public finance economics?’ in Price (2015: 29), Jim replied, ‘I tell incoming graduate students that in the field of public economics, the questions we confront are always fresh because economies go through periods of evolving policy mix, but our underlying analytical tools are remarkably stable’ (ibid.).

Of his many fine qualities as an economist, Jim is unrivalled in his ability to set the table for future research on just about any topic. His approach to research is quite reminiscent of that of two of his early mentors and collaborators, Martin Feldstein and Lawrence Summers, who also used a keen interest in fiscal policy as a lens through which to see a broad range of economic questions. The outcomes were also similar: significant research contributions in many fields, an impressive number of PhD students across decades of work and heroic service to the profession.

2 A Brief Biography

Jim’s path to that classroom in E51 had its origins in and out of his high school classrooms. His high school economics teacher provided an introduction to the subject and also encouraged him to pursue high school debate. As a senior, he won the national “Boys’ Extemp” championship and, along with his partner, the Policy Debate championship. In his own words:

> The skills that I developed in Debate and Extemp have been invaluable in my academic career. Teaching and presenting new research ideas in seminar settings both depend critically on clear, organised, and persuasive communication. Policy Debate also taught me critical thinking and research skills. I trace my interest in economics and tax policy to the national debate topics my freshman and sophomore years in high school. Those topics – federal financing of K-12 education and guaranteed annual income – remain core issues in my research field.[3]

Jim's debate skills have not depreciated since then. Further, the openness to all questions on all topics that is a feature of debate contests is likewise a feature of Jim's career in economics, as is the inclination to think through (at least) two opposing sides of any issue. The sections below will summarise his major contributions in seven broad areas.

Arriving at Harvard as an undergraduate with an interest in economics, Jim was fortunate to find mentors in the discipline. In a connection facilitated by a mutual interest in debate, Jim met Summers, then a graduate student at Harvard working for

[3] See Jim's profile in the Notable Alumni section of the National Speech and Debate Association's website (https://www.speechanddebate.org/notable-alumni/). He describes this pathway in more detail in interviews with Karen Arenson of MIT (see https://infinite.mit.edu/video/james-m-poterba) in 2010 and David Price of the Federal Reserve Bank of Richmond (see Price 2015). This section relies heavily on those interviews.

Feldstein. Larry hired him in his sophomore year as a research assistant. Jim worked for Larry and Kim Clark – collecting data, entering it onto punch cards, and writing computer programmes to analyse labour market transitions between employment and unemployment for projects that were eventually published as Clark and Summers (1979, 1982).

Jim then worked in his junior and senior years as a research assistant for Feldstein, who also advised his undergraduate thesis on various aspects of the tax code and the housing market. Jim graduated Harvard in 1980 with a degree in economics, *summa cum laude* and Phi Beta Kappa. He received the John Williams Prize for graduating with the best overall record in the department that year, and had already started taking graduate level courses in econometrics and public finance.

Having won a Marshall Scholarship, Jim studied at Nuffield College at Oxford University, where he earned his MPhil in economics and the George Webb Medley Thesis Prize in 1982. While at Oxford, he exercised an option to complete his doctorate in three years. He was able to do so while serving as an instructor at MIT, teaching statistics in the fall of 1982. By the end of the fall term, he had an offer to join the faculty at MIT the following year. This worked out nicely, as Nancy Rose, whom he had known since his first year at Harvard and whom he would soon marry, was in the graduate programme there. Returning intermittently to Oxford that year to finish his DPhil, Jim has been a fixture at MIT for the past 40 years.

Jim arrived at MIT just as the post-war generation that built the modern department was retiring. Quoting him in his interview with Price (2015: 28): ‘Attending these retirement

parties, one couldn't help but be swept up in the incredible sense of dedication to economics, and dedication to each other, that this group had in building the department'. This dedication to the department was a value firmly instilled in Jim. In 1994, he began a term as associate department head that lasted for 12 years, where, quoting Jim's recollection of that time in Arenson (2010):

> [I]t's really an internal role where you're doing things like preparing promotion cases, you're trying to find a way to describe the work of your colleagues in a way that will be intelligible to the members of a school council that don't have a lot of economics background. Or helping to plan retirement events where we want to bring alumni back to campus to celebrate someone.

This term was followed up by two years as department head, from 2006–2008. That service ended when Jim began serving as president and CEO of the National Bureau of Economic Research (NBER), a position that he still holds over 15 years later. His ascension to that leadership position followed two prior decades of service at the NBER, including associate director of the Taxation Research Program (1989–1991), director of the Public Economics Research Program (1991–2008), and editor of the annual *Tax Policy and the Economy* volume (1992–2009). During this time, he also served in leadership roles at the *Journal of Public Economics* (co-editor from 1995–1997 and editor from 1998–2006) and the *Rand Journal of Economics* (1986–1995), in addition to associate editorships and advisory board positions at several other journals and leadership positions in both the American Finance Association (AFA) and National Tax Association (NTA).

Through his work at MIT and NBER and his editorial responsibilities, Jim has mentored and supported successive generations of scholars. Among the most notable are three of his doctoral advisees who have received the John Bates Clark Medal, awarded (now) annually to an 'American economist under the age of forty who is judged to have made the most significant contribution to economic thought and knowledge': Steve Levitt (2003), Emmanuel Saez (2009) and Amy Finkelstein (2012).[4] Several other advisees are serving or have served in leadership positions as deans of business schools, as directors of centres and institutes, and in key policy positions in Washington.[5]

As discussed below, Jim's research spans an impressive breadth of topics in macroeconomics, finance and public economics. There is incredible diversity in topic, co-authors and data sources. A unifying theme in Jim's approach in each area is to recognise the importance of that area while the literature is still emerging; to lay out the essential facts clearly and to put them in perspective for the disparate audiences of scholars, research funders and policy makers; and to gather data, apply current methods and thoughtfully interpret the results. His contributions have been widely recognised in the profession, with a Sloan Fellowship in 1988, the Mitsui Professorship at MIT in 1996, fellow of the American Academy of Arts and Sciences in 1996, the Daniel M. Holland Medal of the NTA in 2014, membership in the National Academy of Sciences in 2015, fellow of the AFA in 2021, distinguished fellow of the American Economic Association (AEA) in 2022 and many other accolades.

[4] See https://www.aeaweb.org/about-aea/honors-awards/bates-clark.

[5] His advisees paid tribute to him on the occasion of his Holland Medal award at https://www.youtube.com/watch?v=3R2WzAjdXNY.

I now discuss each research area in turn.

3 Corporations Through the Lens of Taxation

Jim wrote his doctoral dissertation on the effects of dividend taxes on corporate payout policy. In the decades of the 1950s–1970s, there was considerable time series variation in the relative tax rates on dividends and capital gains in the United Kingdom, due primarily to tax reforms in 1965 and 1973. This included different periods when dividends were tax-advantaged and tax-disadvantaged relative to capital gains, providing an ideal environment to conduct these tests. Working with Summers, Jim published three papers during his early years at MIT seeking to understand how taxes affect decisions by firms and their shareholders, the most comprehensive of which is the book chapter Poterba and Summers (1985), drawing heavily on prior journal articles in Poterba and Summers (1983, 1984).

Poterba and Summers (1984) use daily and monthly UK data for 1955–1981 to estimate the effects of dividend tax rates on investors' relative valuations of dividends and capital gains. They divide the sample into three regimes demarcated by the 1965 introduction of capital gains taxes and the 1973 integration of the corporate income tax that reduced the effective tax rate on dividends. They compare estimates across regimes to infer the importance of dividend and capital gains taxes to valuations. Ex-dividend tests on daily data for 16 large UK firms suggest that the introduction of the capital gains tax did not influence ex-dividend day price movements, but the reform of the dividend tax in 1973 did. Using monthly data on a broader sample, they show that the

estimated tax penalty on dividends falls after the 1973 reform by an amount that corresponds to the decline in average marginal tax rates due to the reform. Poterba and Summers (1985) augment this analysis by showing that excess returns were disproportionately positive for high-yield stocks in months with favourable dividend tax announcements.

Poterba and Summers (1983) augment Tobin's Q theory of investment to include corporate taxes, personal taxes and financing constraints. They derive distinct expressions for the marginal investment incentives of firms financed at the margin by new equity issuance versus retained earnings (i.e. reduced dividend payments). The key data are a time series for tax-adjusted Q under the two different financing assumptions and the gross investment rate for the period 1950–1980. Across several different estimation frameworks, the aggregate time series support the model of the "traditional view" in which payout ratios are constrained to be high and the marginal source of funds is new equity issuance, rather than the "tax capitalisation view" in which dividend taxes are essentially lump-sum taxes on shareholders that do not distort real decisions.

These papers helped to shape the burgeoning corporate finance literature of the early 1980s with insights about taxation. As informative as these three papers are about the effects of dividend and capital gains taxes on valuations and investment decisions, they do not by themselves present a theory of why firms pay dividends despite the tax disadvantage that affects both valuation and investment. About a decade later, Bernheim and Wantz (1995) provided empirical support for a dividend signalling model, using the tax framework developed by Poterba and Summers to note that the share price response to dividend announcements was higher in tax regimes in which dividends were more tax

disadvantaged relative to capital gains. This finding is at odds with theories of dividend payments that are based on the "traditional view" of direct investor preferences for regular payments or on constraining the behaviour of managers as in Jensen (1986), but it is consistent with a signalling model in which a higher cost signal indicates a better underlying quality of the firm.

These studies of taxes and corporate payout policy rely on careful calculations of the tax burdens on corporate capital and are part of a broader research effort to understand that rate of return and its implications for corporate behaviour. This effort began for Jim with a collaboration in Feldstein et al. (1983), in which they develop new estimates of the taxes paid on non-financial corporate capital, the pretax rate of return to capital and the effective tax rate based on data from the National Income and Product Accounts (NIPA) and the Federal Reserve Board. Important to these calculations are the state and local taxes, including property tax, paid by corporations. This initial paper highlighted that US productivity in the 1960s was much higher than in the 1970s and somewhat higher than the last years of the 1950s, and that the effective tax rate and the pretax rate of return tended to move in opposite directions across these decades.

Jim returned to these detailed calculations over the years, often in response to significant data revisions that would change prior estimates. Poterba (1998a) updates the calculations for the NIPA revision in January 1997 that changed the algorithm for computing depreciation on physical assets (which generated higher capital stocks and thus lower rates of return). These new calculations showed that the pretax rate of return remained low in the 1980s before rebounding somewhat in the early part of the 1990s. Over the whole 1959–1996 period, taxes on corporations and the investors who supply

capital to corporations absorbed, on average, 54% of the average pretax return of 8.5%.

Tax reforms enacted in the US over the last 40 years often changed the tax incentives for corporate payout policy. In the wake of the Tax Reform Act of 1986 (TRA86), Poterba (1987a) noted that corporate saving had typically accounted for about half of private saving and that the new law reallocated some of the tax burden from the personal to the corporate sector via higher corporate taxes and lower dividend taxes. Aggregate time series evidence suggested that corporate saving would fall and personal saving would only slightly offset that decline.[6] Nearly two decades later, the Jobs and Growth Tax Relief Reconciliation Act of 2003 reduced the individual tax burden on both dividends and capital gains. Poterba (2004a) considered the likely impact of these changes on dividend payout rates in light of the historical record. Aggregate time series regressions estimate a high long-run elasticity of dividends with respect to the tax advantage of dividends relative to capital gains and thus a large likely response to the 2003 tax change.

Jim's continued work in the late 1980s helped develop a more complete picture of where tax considerations would affect corporate decisions and outcomes, beyond the payout decision that motivated his earliest work. For example, Auerbach and Poterba (1987) investigated the extent to which loss offset constraints affect corporate tax incentives. Firms that experience losses in a given year may have limited ability to use them to offset profits from prior years and thus may have to carry them forward to use against profits in future years. Firms with such tax-loss carryfowards may be unable to

[6] This *Brookings Paper* foreshadows an ongoing interest in explaining the saving rate, discussed in more detail in Sections 5 and 7.i below.

take full advantage of corporate tax incentives like subsidies for investment or tax shields associated with debt financing. Auerbach and Poterba quantified these incentives and, using data gathered from corporate annual reports for 1984, estimate that 15% of the firms in the non-financial corporate sector – but only 3% by market value – had such carryforwards.

In two subsequent papers, Jim questions the claim that the capital gains tax is an important determinant of the rate of venture capital activity. Poterba (1989a) documents several stylised facts. For example, fewer than half of venture investors face the individual capital gains tax liability on their realised gains and that most of the growth in venture funding during the 1980s came from tax-exempt investors. Finally, venture investments are shown to account for a miniscule amount of realised capital gains. Instead, Jim points to the internal funding of venture activities – the willingness of entrepreneurs and early employees to accept stock and options rather than wages – as a channel through which capital gains tax rates may affect startup firms. Echoing these findings, Poterba (1989b) notes that a broad-based capital gains tax cut is unlikely to stimulate more venture capital investment.

4 Financial Economics, Moving Away from Efficient Markets

As Shiller (2003) notes in his review of the evolution of finance from the efficient markets hypothesis (EMH) to behavioural finance, faith in the EMH was eroded in the 1980s due to the documentation of several anomalies and other empirical findings that are inconsistent with the EMH. Perhaps the most persuasive such findings were his own tests of excess volatility in Shiller (1981), showing that the stock market moves more

frequently than can be justified by movements in the fundamentals that should determine stock prices under the EMH.

That evolution was slow and required many years of supporting evidence. For example, an early objection to drawing sharp conclusions based on Shiller (ibid.) was that changes in risk could be responsible for a large portion of the variation in stock prices and thus for excess volatility tests to reject the EMH. In response to such objections, Poterba and Summers (1986) make the very straightforward point that shocks to volatility in stock prices decay rapidly and therefore cannot affect required returns outside of a short window. Using both daily index return data and implied volatilities from options, they show that volatility measures are only weakly serially correlated. This, in turn, makes it unlikely that fluctuations in risk premia due to changes in volatility generate the observed excess volatility in stock prices.

A corollary to the finding that the stock market shows excess volatility is that it will exhibit mean reversion – a tendency for unusually large positive or negative returns to be subsequently reversed. If the reversion is predictable and brings with it neither additional risk nor substantial tax consequences or transaction costs, then it opens the possibility of riskless profit and thus violates EMH. In what is Jim's most-highly cited paper based on Google Scholar,[7] Poterba and Summers (1988) conduct a comprehensive study of mean reversion in stock prices using long time series of monthly and annual market returns in the US and 17 international markets, as well as individual US securities. The main results suggesting that stock returns show positive

[7] See Jim's profile at https://scholar.google.com/citations?user=CjY21_oAAAAJ&hl=en&oi=ao.

serial correlation over short periods and negative correlation over longer intervals became the key stylised fact to explain in the subsequent literature on excess volatility. Their results showed that mean reversion was widespread, with transitory shocks accounting for more than half of the monthly return variance.

Robust findings of excess volatility and mean reversion, not driven by changes in fundamentals, suggest that stock market participants are trading based on some other factor. This suggestion was given further support by Jim and Larry, now working with Jim's PhD student, David Cutler. In Cutler et al. (1989), they demonstrate first that macroeconomic news can explain no more than about a third of stock market return variance. They then show that there is only a loose overlap between days with large market movements and those with news on major political and world events. Cutler et al. (1991) affirm the key stylised facts about rejections of the EMH across a broad range of asset markets, including stocks, bonds, foreign exchange, real estate, collectibles and precious metals. In particular, they show that returns are positively serially correlated over short durations and negatively serially correlated over longer horizons, and that deviations of asset prices from fundamentals can predict subsequent returns. That the evidence exists across several different asset classes again suggests the need for a different underlying model than the EMH. They posit that such a model could be based on speculative dynamics, or 'interactions between different types of traders, some of whom are not rational in the conventional sense of trading on the basis of all publicly available information' (ibid.: 529). In an *American Economic Review* paper published in 1990 under the title "Speculative Dynamics and the Role of Feedback Traders", Jim and his co-authors note that the key stylised facts can be explained by a model with three types of traders: rational, fundamental (possibly operating with a lag) and feedback.

One of the interesting phenomena in stock market valuations during the 1980s was the overvaluation of the Japanese market. For example, the price-earnings ratio on the Nikkei Index of Japanese stocks nearly doubled between 1984 and 1989 and fell by nearly 40% in 1990. Collaborating with Ken French, Jim asked the question, "Were Japanese Stock Prices Too High?" in French and Poterba (1991a). The answer was a resounding "yes". While they show that differences in accounting systems could explain about half of the difference between the price-earnings ratios in the US and Japanese stock markets, the wide swings in this ratio over the 1980s are not attributable to accounting conventions. As in the prior work seeking to understand excess volatility results, nor could the stock price movements in Japan be attributed to changes in fundamentals like discount rates or growth opportunities.

Their work on Japanese stock market overvaluation led to another mystery in financial markets – the lack of international diversification of stock market investors. In French and Poterba (1991b), another of Jim's most-highly cited papers, they construct estimates of the international equity portfolio holdings in Japan, the US, and the UK based on cross-border equity transactions. They note that international holdings of 2%, 6% and 18%, respectively, imply that investors in each country expect annual returns in their domestic markets to be several percentage points higher than in foreign markets. They conclude that a lack of diversification of this severity suggests that it is investor choices, not institutional constraints, that are responsible. Documenting such an irrational set of expectations was an early contribution to the emerging literature on behavioural finance.

This decade of effort, by Jim and co-authors and multiple other researchers, to first

demonstrate and validate rejections of the EMH and then to posit alternative frameworks culminated in the noise trader approach to finance in De Long et al. (1990), which was already circulating in working paper form as early as 1988. The highlight of the model is a class of traders who are motivated by "sentiment", a misperception of fundamentals that is random over time but correlated across noise traders at a point in time. The equilibrium asset pricing relationship permits the possibility that noise traders earn a risk premium for holding the systematic risk that they introduce into the market, with the corollary that we should not expect noise traders to disappear from financial markets due to their poor market timing.

5 Changes in Saving and Wealth

The decades of the 1980s and 1990s saw changes in consumption and saving patterns in the US economy. In the 1980s, the saving rate declined, in both the public and private sectors, after decades of relative stability. In the 1990s, stock market returns were uncommonly high as stock ownership became more widespread, resulting in possible wealth effects on aggregate consumption. While the impetus for studying the causes and consequences of these two phenomena was their macroeconomic importance, Jim's research in these areas began a migration to a greater focus on microeconomic questions.

Poterba and Summers (1987) note that US fiscal deficits in the 1980s, due in part to lower taxes and in part to higher spending, coincided with a substantial increase in the consumption share of output and a decline in the national and even private saving rate. They also show that consumer spending rose when tax cuts are implemented rather than

announced, suggesting the presence of a departure from the standard life-cycle model (such as liquidity constraints or myopia) and the failure of the assumptions of Ricardian equivalence. These conclusions are reinforced by evidence in Poterba (1988), where Jim shows using monthly consumption data that consumption responded to temporary income shocks in 1968 and 1975 by more than suggested by the permanent income hypothesis.

As the magnitude of the decline in the saving rate became clear, Bosworth et al. (1991) turned to household survey data to help distinguish between competing explanations. In his comments on that *Brookings Paper*, Jim summarised the three key stylised facts: '(1) saving rates for all age groups have declined; (2) saving rates for young households have declined less than saving rates for older households; and (3) saving rates of home-owners have declined by more than saving rates of renters' (Poterba in ibid.: 243). Following the theme of earlier work on asset prices, Jim was very interested in looking beyond the US to consider household saving patterns. In the early 1990s, he convened two conferences and edited two volumes as part of an NBER project analysing saving incentives and behaviour in several OECD countries. Poterba (1994a) notes the wide variation in saving rates and their decline across industrialised countries and a similarly wide variation in policies to promote personal saving. Important among the findings is that countries like Germany and Japan with high saving rates typically discourage consumer borrowing. Poterba (1994b) includes chapters focusing on household data sets across the sample of countries. The framework highlights possible differences due to demographic composition, credit institutions, social insurance programs, age-income profiles and the tax environment that was the focus of Poterba (1994a). Data show that the life-cycle model's presumption of dissaving after retirement is not generally

supported, suggesting an important bequest motive. In most countries, the median household typically accumulates only modest reserves, consistent with the buffer stock model of Carroll (1992). These projects on saving were a precursor to an extensive body of work on tax-deferred savings accounts, discussed in Section 7.i below.

The earlier finding that saving rates for homeowners declined more rapidly than for non-homeowners sparked an interest in whether wealth effects more generally were responsible for increases in consumption and thus declines in the saving rate. Given the dramatic increase in stock market values in the earliest stage of what would later become the dot-com bubble, Jim and I investigated the link between stock ownership patterns, stock market fluctuations and consumption in Poterba and Samwick (1995). After documenting the trend toward greater stock ownership in the US household sector and broader ownership due to the proliferation of mutual funds and defined contribution pension plans, we tested for the importance of the wealth effect by studying the impact of stock price changes on the share of consumption devoted to luxury items and the effect of changing stock ownership patterns on the link between stock price fluctuations and consumption growth. We found virtually no evidence to support important wealth effects associated with stock price changes and concluded that the correlation between stock market movements and consumption is due to the stock market's role as a leading indicator. Further analysis in Poterba (2000) based on continued stock market appreciation and later data on household stock ownership suggested a marginal propensity to consume out of stock market wealth of about 2%. These studies were a precursor to further analyses of household portfolio behaviour, discussed in Section 7.ii below.

6 Economic Implications of Demographic Change

Nearly from the moment that the Social Security system was reformed in 1983, economists began to consider the long-term implications of the reform and population ageing more broadly. The decline in fertility rates that marked the end of the baby boom, combined with projections of continued improvements in old-age mortality, portended a shift to an older steady-state population. The consequences of this shift became a major focus of Jim's research. Starting in 1990 with a *Brookings Paper* entitled "An Aging Society: Opportunity or Challenge?", Jim and his co-authors consider the extent to which population ageing would be a macroeconomic challenge and the extent to which fiscal policy should respond to it. Focusing on saving and productivity growth, they conclude that demographic changes would increase incomes over the subsequent 20 years but reduce them by about 10% over the longer term, an amount equivalent to a decline of about 0.15% per year in productivity growth.

The paper is notable for its careful reasoning that leads to a contrarian conclusion – demographic change was not the cause for immediate concern that many had conjectured. Further, it accurately predicted the consumption boom of the subsequent three decades, as the decline in labour force growth permitted a reduction in the share of net investment in total income while maintaining the capital intensity in the economy. That the slowdown in labour force growth preceded the increase in the dependency ratio permitted consumption to rise. The paper also pointed out that the rate of population ageing in the United States was less than that found in other countries.

Complementing this interest in the link between demographics and saving was a shared

interest in the implications of ageing for household portfolio choice. In Poterba and Samwick (2001), we were motivated by the relevance of portfolio allocation to overall accumulation, the devolution of more investment decisions from defined-benefit pension plan sponsors to individual investors in tax-deferred retirement accounts like 401(k) plans, as well as then-popular discussions about whether personal retirement accounts might play a role in Social Security reform. Using multiple early waves of the Survey of Consumer Finances (SCF), we showed that the typical hump-shaped age profile of accumulation and decumulation was not uniform across financial assets and that there were significant differences in the probability of owning, and the portfolio share devoted to, most financial asset categories by cohort. For example, older households at the time of the survey were more likely to hold corporate stock and less likely to hold tax-exempt bonds than were younger households at any given age.

Jim continued this work on the link between demographic change and asset markets in Poterba (2001a), the inaugural *Review of Economics and Statistics* lecture, and in Poterba (2004b), a contribution to the annual Jackson Hole symposium. As in the 1990 *Brookings Paper* with Cutler, Sheiner and Summers, his analysis reaches conclusions that are contrary to the predictions of standard macroeconomic models of population ageing. Using an analogous framework to Poterba and Samwick (2001), Poterba (2001a) shows that with time effects constrained to be zero, but cohort and age effects in the model, estimated age-wealth profiles decline only gradually at older ages after rising when households are young and working. Based on these estimates, Jim concludes that projected changes in the age structure of the US population through 2050 do not portend a sharp decline in asset demand.[8] Further, relying on time series

[8] While Jim interprets this stability of asset demand as evidence against a fall in asset

regressions, Jim demonstrates that there is no robust relationship between stock returns and the age structure of the US population. To the extent that there is any relationship, it is between age structure and the safe rate of return at various horizons. Poterba (2004b) further notes a historical correlation between asset levels, such as the price-dividend ratio, and measures of the population age structure.

Two other areas in which Jim investigated demographic links were housing markets, discussed in Section 8.i below, and public support for education. In particular, Poterba (1997a) uses panel data on states over the 1960–1990 period to show that the relationship between per-child educational spending in public schools and the share of elderly residents is negative. The negative relationship is more pronounced when the elderly population and the school-age population are from different racial groups. Following up in Poterba (1998b), Jim considers the implications of this expenditure pattern in light of the ongoing ageing of the US population and explores reasons why self-interested elderly voters might nonetheless support expenditures on public education.

7 Taxation and the Life-Cycle Model

Jim's work on demographics, saving, financial markets and tax policy at the macro level described in the prior four sections collectively set the stage for extensive work with a

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prices in the face of population ageing, in his discussion of the paper, Abel (2001) develops a model with an endogenous supply of capital in which 'the equilibrium price of capital may fall when baby boomers retire, even if the demand for capital by retired baby boomers remains high' (ibid.: 589).

microeconomic focus. We now discuss this research, focusing particularly on the questions of saving for retirement, household portfolio allocation that converts saving into wealth accumulation and annuity markets that convert wealth into old-age income.

7.i. Retirement Saving

In his interview with Price (2015), Jim noted that his interest in the economics of retirement grew out of his work on tax policy. The latter has several features to encourage saving in traditional employer-provided pensions, 401(k)-type plans in which the participant directs investment choices and individual retirement accounts (IRAs) that are not connected to a particular employer. Jim was fortunate to have a long collaboration with David Wise and Steven Venti that began with the question of whether assets that accumulated in 401(k) plans and IRAs represented a net increment to household wealth. The review of this body of work is, by necessity, excessively brief; Poterba, Venti and Wise co-authored over 30 papers.

The key question for tax-deferred retirement savings vehicles is whether tax incentives lead to higher total saving and thus preparedness for retirement (even apart from their impact on the fiscal deficit). In the early 1990s, as questions about the decline in the national saving rate were shaping the macroeconomic literature discussed in Section 5, Venti and Wise (1990) provided an answer based on data in the Consumer Expenditure Survey, noting that there appears to be little offset of higher balances in IRAs with lower amounts in other financial assets. This echoed findings in several of their earlier studies using different data sources. In contrast, Gale and Scholz (1994) note that at the time, most IRA contributors were over 59 (and thus face no penalty on withdrawals) or

have significant financial assets outside of IRAs, enabling them to fund IRA contributions without a net increase in saving. They estimate a model on SCF data in which increases in the IRA contribution limit would generate little incremental saving.

This disagreement was replayed in a new stream of literature when Jim joined the team and the focus shifted to employer-sponsored 401(k) plans. While the offering of 401(k) plans through employers attenuates some concern about participants and non-participants being different in their preferences for saving, the same concerns about setting up valid comparisons across groups arise. Poterba et al. (1995) compare the financial assets of households with a member eligible for a 401(k) with households that are ineligible and evaluate the changes over time within similarly situated households. They conclude that there is little evidence that contributions to 401(k) plans have come at the expense of other forms of saving. Engen et al. (1996) counter that comparisons across groups should allow for offsets not only in financial assets but more broadly in higher debt and lower non-financial assets. They also note that comparisons between balances in tax-deferred and taxable accounts need to account for the tax rebate from the contribution to the former to assess whether net savings increased. Writing in the same symposium in the *Journal of Economic Perspectives*, Poterba et al. (1996) summarise their earlier findings, attempt to reconcile them with those of other authors, and point to methodological limitations as the source of the discrepancies.

As Jim reflects in his Richard T. Ely Lecture (see Poterba 2014), his research agenda broadened from questions about the effect of taxes on retirement saving to retirement security more generally. Clearly present is the concern from Section 6 about how welfare and fiscal policy will change in an ageing population. He documents

unevenness in the pace of mortality decline across the US population as well as different degrees of dependence on Social Security for households who arrive at retirement with very low assets versus those who have taken advantage of 401(k) plans or other pensions to accumulate life-cycle wealth.

A longstanding concern about retirement security for current and future cohorts has been the implications of the shift from defined benefit (DB) to defined contribution (DC) pension plans. In Poterba et al. (2007), Jim and his co-authors use the Health and Retirement Study to simulate the distribution of retirement wealth under representative DB and DC plans, illustrating how investment returns, plan characteristics and earnings histories affect the distribution of retirement income. Echoing earlier work by Samwick and Skinner (2004) using the SCF, they show that average retirement wealth under DC plans exceed that of private sector DB plans, although DC plans are more likely to result in very low retirement wealth outcomes. Another concern, the focus of Section 7.iii below, is the potential lack of annuitization of retired households beyond Social Security benefits. Poterba et al. (2011) show that only about half of households entering retirement could increase their annual income by as much as $5,000 per year, even if they annuitized all of their financial assets. Housing equity, which households tend not to spend down in a life-cycle pattern, may instead provide additional longevity insurance.

7.ii. Household Portfolios

The US personal income tax system includes several features that cause marginal tax rates to differ across investors and across assets, including the progressivity of the

ordinary income tax schedule, the preferential tax treatment of capital gains and tax-exempt bonds and the tax deferral inherent in retirement savings vehicles discussed above. As Jim notes in a summary of this line of research (see Poterba 2004c: 18): 'Investigating whether households recognise the incentives that are built into the income tax code, and then studying whether they change their behaviour in response to these incentives, is one of the perennial research missions of empirical public economics'. Jim and I began our work on this topic at a very broad level in a project that was eventually published as Poterba and Samwick (2003). Using successive waves of the SCF from 1983–1998 and an algorithm to calculate marginal tax rates, we show that, conditional on income, households with higher marginal tax rates are more likely to hold tax-preferred assets like tax-exempt bonds and tax-deferred retirement accounts and to allocate a greater fraction of their portfolios to such assets.[9]

Continuing his work with the SCF, Bergstresser and Poterba (2004) focused on the asset allocation decision – not just what assets to hold but whether to hold them in taxable or tax-deferred accounts. A key finding was that households tend to allocate similar shares of their portfolio to equity in both types of account. Some households hold tax-inefficient portfolios – fixed-income assets in their taxable accounts – but the magnitude of the inefficiency is typically quite small. In Poterba et al. (2004), Jim shows that the conventional wisdom that argues for fixed-income assets in the tax-deferred account and preferentially taxed equity in the taxable account would have been an inferior strategy historically for highly taxed households. Omitted from the standard comparison is that when equity is held as a mutual fund rather than directly, the tax burden imposed

[9] Jim discusses these findings, along with those below, in Poterba (2002), a chapter on taxation and portfolio choice in the *Handbook of Public Economics*.

by the mutual fund's trading activities reduces the returns to holding equity in a taxable account. In addition, the ability to hold fixed-income assets in the form of tax-exempt bonds erodes much of the tax advantage of holding taxable bonds in tax-deferred accounts.

The tax optimality of investor portfolios naturally arose from Jim's longstanding interest in capital gains tax, discussed in Section 3 above. His early work highlighted the scope for additional tax-minimising behaviour. For example, Poterba (1987b) used data on capital gains realisations from tax returns to demonstrate that a sizable minority of capital gains accrue to investors who are not engaging in investment strategies – such as offsetting realised gains with realised losses – that could reduce their taxes. Later work provided some evidence of tax-minimising behaviour. Ivković et al. (2005) analyse stock trades made by individuals holding stock in both taxable and tax-deferred accounts and show that capital gains are less likely to be realised in taxable accounts, while losses are more likely to be realised in taxable accounts. Poterba and Weisbenner (2001) used changes in the statutory requirements for a capital loss to be considered "long term", and thus less valuable in offsetting ordinary income, to show that tax-loss selling by taxable individual investors explains at least part of the "January effect" in which stock returns are abnormally high after the turn of the year.

A final strand of Jim's work on household portfolios concerns the tax efficiency of mutual funds and exchange-traded funds (ETFs). Focusing on equity mutual funds, Bergstresser and Poterba (2002) show that over the period from 1993–1999, inflows to funds were better explained by after-tax returns rather than pre-tax returns. They also show that funds with large amounts of unrealised capital gains had smaller inflows than

funds without such gains, which is consistent with investors understanding the negative implications of such unrealised gains on their future taxable returns. Poterba and Shoven (2002) explore the differences between traditional, open-ended mutual funds and ETFs as the latter experienced rapid growth in the late 1990s. ETFs can be more tax efficient by lessening the distribution of realised capital gains to individual investors through procedures such as "redemption in kind". Poterba and Shoven compare an index fund and an ETF that track the same portfolio and show that over their sample period, the tax advantage of the ETF was roughly offset by a higher pretax return on the index fund.

7.iii. Annuity Markets

The standard presentation of the life cycle model emphasises retirement income adequacy as the main motivation for household saving. It is only a small step from that motivation to a further desire to ensure that income in retirement remains adequate over a household's remaining lifetime. As longevity is uncertain, there is a strong presumption that households would choose to annuitize most of their wealth in retirement, following the lead of the Social Security programme, which provides benefits as annuities with strong inflation and survivorship protections. However, households typically exhibit low rates of annuitization, a puzzle described by Friedman and Warshawsky (1990) and attributed to low yields relative to alternative investments. Given the centrality of this puzzle to the life-cycle model, Jim initiated a research agenda in the late 1990s that proceeded in two phases.

In the first phase, working with Olivia Michell, Jeff Brown and Mark Warshawsky, Jim

revisited the basic features of the annuity market in the United States.[10] In Mitchell et al. (1999), they establish a careful methodology for calculating the money's worth of annuities and importantly note that it had improved since the time period examined by Friedman and Warshawsky, potentially deepening the under-annuitization puzzle. They establish several key facts, including that the annuity market in the mid-1990s exhibited wide variation in pricing for largely similar products; that adverse selection was noticeable, with a money's worth calculation that was 10 percentage points higher for annuitants than for the general population; and that this adverse selection essentially offset the welfare gain that would obtain from annuitizing at an actuarially fair rate. Continuing the search for explanations for limited participation in the market, Brown and Poterba (2000: 528) note that 'virtually all of the previous research on annuities has focused on individuals rather than couples as decision-making units', and focused their analysis on the welfare gain to couples using joint-life annuity products. Their annuity valuation model for married couples shows that the utility gain from annuitization is smaller for couples than for single individuals.[11]

While the two prior papers drew some motivation from then-topical discussions of

[10] Their jointly authored volume, *The Role of Annuity Markets in Financing Retirement* (Brown et al. 2001), draws on the published research described below and highlights the role of annuities of various forms in protecting against risks in old age.

[11] Another explanation for low rates of annuitization is that households have important bequest motives. Related work in Poterba (2001b) casts some doubt on an intricate, dynastic model of behaviour. Using the SCF 1995, Jim shows that a majority of elderly households at risk of facing the estate tax are not making *inter vivos* transfers that would reduce their estate taxes and thus increase the bequests received by their heirs.

investment-based Social Security reform, Brown et al. (2001) address the connection of annuitization to such reform squarely in an NBER volume devoted to the risk aspects of investment-based Social Security reform (see Campbell and Feldstein 2001). Of particular concern is the extent to which personal accounts invested in equities and bonds could replicate the value of the inflation protection offered in the existing Social Security programme. They note that despite the historically high real returns on equity over the post-war period, the scope for inflation protection is limited because stock returns are not highly correlated with inflation. However, under reasonable assumptions about risk aversion, they show that variable annuities with equity-linked payments would be more valuable to beneficiaries because the equity premium more than compensates for the additional volatility in real payouts.

Jim's second phase of annuity research began with his collaboration with Amy Finkelstein. The market for annuities is larger and more developed in the United Kingdom than in the United States and other countries. This made it a compelling area of study as they considered evidence of asymmetric information and adverse selection. For example, in Finkelstein and Poterba (2002) they make use of the separate markets for annuities – voluntary and compulsory – in the UK. As evidence of adverse selection, they note that annuitants are longer-lived than non-annuitants and that this difference is more pronounced in the voluntary market compared to the compulsory market. They also show that adverse selection is present in the choice of different annuity products, with longer-lived annuitants selecting products that are more backloaded and shorter-lived annuitants selecting products that make payments to the beneficiary's estate in the event of early death. This latter finding is confirmed in Finkelstein and Poterba (2004), in which they also show contrary evidence that there is no important variation in

subsequent mortality based on the size of annuity contract.

Two subsequent papers study the annuity market focused on the exclusion of certain characteristics, whether involuntarily or voluntarily, from the pricing of contracts. Finkelstein et al. (2009) analyse a ban on gender-based pricing in the compulsory annuity market in the UK. Given longer life expectancies for women, unisex pricing serves to transfer resources from men to women. Even allowing for insurance companies to adjust their offerings in light of the policy change, they find that banning gender-based pricing would redistribute resources, with men worse off by an amount equivalent to losing at least 3% of their retirement wealth. Modifications to the annuity products offered have reduced this redistribution by about half. Finkelstein and Poterba (2014) note that although they were not prohibited from doing so, annuity providers in the UK historically had not conditioned on the location of residence in pricing annuities. (They do now.) Referring to such information as an "unused observable", they construct a test for asymmetric information and show that the socioeconomic status in the annuitant's location predicts future longevity and is positively correlated with the size of the annuity purchase.

8 A More (State and) Local Focus

Jim's contributions in state and local finance in the mid-1990s had two main antecedents. The first was a longstanding interest in housing markets (dating from his undergraduate thesis), a topic with a macroeconomic focus and broader implications for taxation and public finance. Housing markets are a barometer for local economic conditions, which in turn have implications for a state's fiscal health. The second was

his work on federal fiscal policy, discussed in Section 5, and the emergence of large federal deficits in the US during the 1980s and their continuation despite contractionary fiscal policy in the early 1990s. Unlike the federal government, states typically cannot run protracted deficits, and the wide variety in fiscal institutions they use to balance budgets could be informative in designing better policies at the federal level. This section discusses Jim's major contributions in housing and state fiscal policy in turn.

8.i. Housing

The unique features of owner-occupied housing as both an investment and a consumption good require a valuation model that goes beyond standard approaches to either in isolation. Poterba (1984) developed an asset-market model of the housing market that incorporated both inflation and tax-advantages to owner-occupied housing. Because high inflation reduces the user cost of housing in the model, Jim shows that as much as 30% of the then-recent increase in real house prices could be attributed to the high inflation of the 1970s. Further, with lower user costs, persistent inflation could expand the supply of owner-occupied housing. This paper remains Jim's most-highly cited sole-authored paper.

Volatility in the housing market during the 1980s offered further opportunities to investigate the determinants of housing prices. In a *Brookings Paper* prompted in part by the first nominal house price declines in decades, Poterba (1991a) attempts to distinguish between competing theories of price determination. The finding that larger houses both appreciated more in the early part of the decade and fell more in the latter part supports a model in which the user cost of housing plays an important role. That

lagged price appreciation predicts current price appreciation, and that many countries experienced volatility in house prices, suggest a role for speculative bubbles in housing markets. Finally, evidence shows that house price appreciation across US cities had little relation to their age composition, casting doubt on demographic change as an explanation. This negative conclusion for demographics is further supported by Engelhardt and Poterba (1991), who show that Canadian house prices exhibited different dynamics over the 1970s and 1980s compared to the United States despite having very similar demographic demand for housing. Time series regressions show no positive, significant relationship between house prices and demographic demand.

Housing markets in the US were also disrupted in the 1980s due to the passage of TRA86. Poterba (1992) shows that both the decrease in marginal tax rates and the increase in the standard deduction (resulting in fewer household itemising mortgage interest deductions) lowered the tax-induced distortions to the user cost of owner-occupied housing. These changes would contribute to lower house price appreciation in subsequent years. However, the most significant consequence of TRA86 for housing markets may have been the reduction in incentives for rental housing investment, which were followed by over a two-thirds reduction in multifamily housing starts between 1985 and 1991. In later work responding in part to the run-up in housing prices that presaged the Great Recession, Poterba and Sinai (2008) review the full impact of federal tax policy on the owner-occupied housing market, including not only the deductibility of mortgage interest and property taxes and the special treatment of capital gains on housing but the exclusion of imputed rent for homeowners. Using the NBER Taxsim algorithm and the SCF 2004, they show the distributional consequences of repealing each of these tax advantages of owner-occupied housing.

8.ii. State Fiscal Policy

These disruptions to housing markets, through inflation and tax changes, were also reflected in shocks to state fiscal conditions during the period around the recession of the early 1990s. Of particular interest to Jim's early research in this area were the differences in state fiscal institutions across states and how those differences translated into state fiscal policy. Poterba (1994c), another of Jim's most-highly cited sole-authored papers, lays out some important findings based on new estimates of the unexpected fiscal shocks that states experienced between 1988–1992. Overall, at least half of an unexpected deficit is corrected within a year, with states that have more restrictive fiscal institutions, such as limits on taxes or expenditures, adjusting more rapidly. Further, political institutions are relevant – deficit adjustment is faster when one political party controls the state legislature and the governorship, and more modest in gubernatorial election years.[12]

A trio of follow-up papers provide further detail on the variation in state fiscal institutions and draw implications for the federal budget process. In Poterba (1995a),

[12] The interaction between political factors and economic outcomes is a longstanding research interest of Jim's. One of his earliest papers was Golden and Poterba (1980), which provided evidence against the importance of the political business cycle as an explanation for macroeconomic outcomes. In later work, Levitt and Poterba (1999) show that states with very senior Democratic congressional delegations grew more rapidly over the 1950s through the 1980s than those with less senior delegations, as did states with more electorally competitive House districts.

Jim documents that even restrictive state fiscal institutions have limits – most states allow some borrowing to be used to achieve budget balance and apply that concept to only a part of their budget. There are also almost no formal enforcement mechanisms. Nonetheless, the empirical evidence clearly suggests that stricter anti-deficit rules combined with limits on government borrowing generate smaller deficits and more rapid adjustment to unexpected fiscal shocks. In this paper and in Poterba (1996), Jim concludes from the evidence that there is scope for curbing federal deficits by adopting similar measures at the national level to those found at the state level. Poterba (1995b) considers the importance of pay-as-you-go rules and maintaining separate capital and operating budgets, and finds that while states with capital budgets spend more on capital projects than states with unified budgets, there is no relationship between having a capital budget and non-capital spending. States that have pay-as-you-go rules for financing capital projects tend to have lower capital and non-capital expenditures.

As with earlier work on saving discussed in Section 5 above, Jim also sought evidence by way of international comparisons to ascertain whether fiscal institutions affect budget outcomes. This search began in Poterba (1997b), a contribution to a conference volume in which the prior evidence from the states was combined with a summary of evidence across countries. The latter focused on both the centralisation of budget authority and the transparency of the budget process, and suggested that, as with states, countries with tighter budget rules ran smaller deficits and borrowed less. Jim then collaborated with Jürgen von Hagen to edit a volume, *Fiscal Institutions and Fiscal Performance*, to synthesise the international evidence. The broad conclusions for a range of different geographies, whether within or across countries, are that fiscal institutions affect outcomes, although the precise mechanisms by which they do so are

less clear.

Rounding out Jim's major work on fiscal institutions was a collaboration with Kim Rueben on the implications of these institutions for state and local bond pricing and public sector wages. In a chapter in the Poterba and von Hagen (1999) volume, Poterba and Rueben (1999) show that states with tighter anti-deficit rules, more restrictive limits on debt finance and fiscal restraints that control expenditures face lower borrowing costs. By contrast, states with restrictions on taxing authority face higher borrowing costs. Examining the period from 1988–1998, Poterba and Rueben (2001) find that while unexpected deficits are correlated with higher state bond yields, the correlation is moderated in the presence of tighter anti-deficit rules. In earlier work, Poterba and Rueben (1994) first documented the wide variation across states in the relative wage growth between private and public sector workers during the 1980s. More (less) educated workers tended to fare better in the private (public) sector. In Poterba and Rueben (1995), they show that states with property tax limits tended to have slower wage growth for local government employees and, to a lesser extent, lower local government employment growth.

9 Tax Reform

From time to time during his career, Jim has weighed in on important reforms or possible reforms to the tax code. For example, in the early 1990s, economists placed renewed emphasis on how the tax code might be used to address environmental externalities. Jim's work on environmental topics began by contemplating increases in the gasoline tax that would be required to curb consumption of fossil fuels. A common

argument against such Pigouvian taxes is the perception that they are regressive. Poterba (1989c) makes the point that for excise taxes on sin goods – gasoline, alcohol and tobacco – this perception is coloured by the use of annual income as the measure of well-being. Using expenditures as a proxy for lifetime income, which is less variable, excise taxes are shown to be less regressive. Following up, Poterba (1991b) shows that, excluding households at the very top of the income distribution, the share of annual expenditure devoted to retail gasoline purchases is more stable across the population than is the corresponding share measured with respect to current income.

This early work led to a volume co-edited with Rudi Dornbusch on economic responses to global warming. In his contribution to that volume, Poterba (1991c), Jim considers issues in the design and implementation of a carbon tax. A key point is that rapid stabilisation of carbon dioxide emissions would require very large carbon taxes – sufficient to double or triple the producer prices of fossil fuels like petroleum, natural gas and coal. Poterba (1993) considers the prospects for environmental policy reform at the international level and options for developed and developing countries, including efforts to curb deforestation.

As another example, TRA86 was the most comprehensive reform of the US income tax code in the post-war period. Jim was quick to understand the far-reaching scope of the law and to accurately assess its likely impacts. Writing in the inaugural symposium in the *Journal of Economic Perspectives*, Hausman and Poterba (1987) show that, contrary to popular descriptions of the legislation, the actual changes in marginal tax rates was generally small for households other than those at the highest income tax levels. Combined with modest estimated labour supply and saving elasticities in the existing

literature, this would generate minimal behavioural changes for most households. However, using four decades of tax return data concluding in 1990, Feenberg and Poterba (1993) document that the share of total adjusted gross income (AGI) reported on the top 0.25% of tax returns (ranked by AGI) increased sharply in 1987 and 1988. Because TRA86 lowered marginal tax rates for high-income households well beyond this small group and the fact that the dramatic increase is found only at the very top, they attribute the change to reduced incentives to engage in tax avoidance activities rather than more fundamental changes in economic behaviour. Subsequent work including five additional years of tax return data in Feenberg and Poterba (2000) continued to show that most of the widening of inequality in tax data occurred immediately after TRA86. These papers foreshadowed a greater interest by other researchers in using tax return data to study growing income inequality, summarised in Atkinson et al. (2011).

Though he has not served formally in government, Jim has advised tax reform initiatives on multiple occasions. In 2005, he served on the President's Advisory Panel on Federal Tax Reform, focused on promoting economic growth, simplifying the tax code and improving tax collection without changing the distribution of tax burdens by income. Poterba (2007) briefly reflects on the Panel's work, including the challenges posed by its recommendation to repeal the alternative minimum tax and broaden the tax base through limitations on existing tax expenditures for home mortgage interest, health insurance premiums, and state and local tax deductions.[13] Notably, several of these

[13] Some of Jim's testimony as part of the panel's work is available from C-SPAN: https://www.c-span.org/search/?searchtype=Videos&sort=Newest&personid%5B%5D=9268.

issues were taken up in subsequent tax legislation. In 2010, Jim served as one of ten panellists for the Mirrlees Review (see Mirrlees et al. 2010, 2011) to contemplate the ideal tax system for a modern, open economy and to consider pathways for how the UK tax code might be improved along those lines. As summarised in Mirrlees et al. (2012), it revisited familiar ground for broadening tax bases (including for value-added taxes), targeted environmental taxes and harmonising tax rates across income sources (including from the corporate sector).

10 Conclusion

Jim Poterba's research is never far from taxation and its impact on economic outcomes. For more than 40 years, he has used that focus to pursue a very broad agenda that began in macroeconomics and corporate finance and evolved into microeconomic analyses in many areas of public economics. Many of his former students and colleagues, myself included, have been fortunate to collaborate with him and to continue to learn from his example and insights. While his most influential scholarship is published in top general interest journals and field journals in public economics and finance, he has many well-cited publications in the *Brookings Papers on Economic Activity*, the *Papers and Proceedings* of the AEA, the *Journal of Economic Perspectives* and numerous edited volumes from NBER conferences published by the University of Chicago Press. He is a communicator of economic ideas without equal, whether the venue is for scholars, policy makers or the public.

Jim now spends the bulk of his professional time as president and CEO of the NBER, an organisation that in his words (quoting from Price 2015: 29), 'is devoted to carrying out

and to supporting economic research, to disseminating research, and to helping educate the academic, policy, and business communities, and to some degree the public, about economic activity and economic analysis'. When his predecessor and mentor, Martin Feldstein, stepped down after over three decades at the helm of the NBER, he said of Jim:

> I cannot think of anyone who would be a better leader of the NBER in the years ahead – with his breadth of interests in economics, his intellectual ability, the respect that he has in the profession, and his willingness to give of himself for the benefit of the organisation. I'm confident that he will do an outstanding job (Feldstein 2008: 1).

The NBER continues to grow and thrive under Jim's leadership, expanding the number of affiliated researchers by over 60%, distributing more than a thousand new research studies each year and convening over 100 research meetings per year.[14] When asked by Price (2015: 29) about his most enjoyable part of the job, Jim replied: '[T]rying to launch and direct research projects on particular topics … These projects provide an opportunity for me to work with an array of researchers to develop research proposals and to seek funding for these initiatives'. All fields continue to be wide open.

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[14] See https://www.nber.org/about-nber/history.

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