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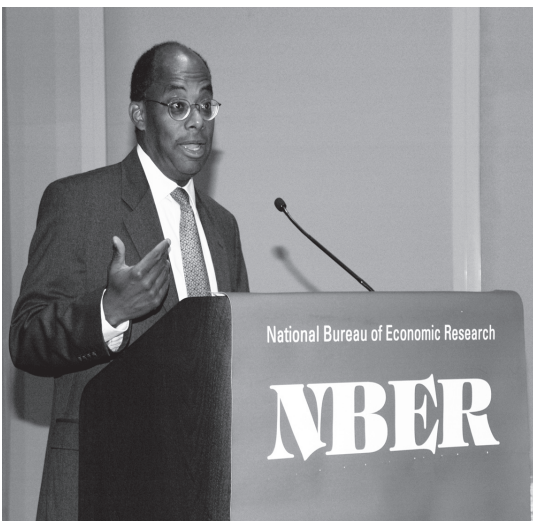
# NBER Reporter

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2010 Number 3

## The 2010 Martin Feldstein Lecture



*Roger W. Ferguson, Jr.*

### Remarks by Roger W. Ferguson, Jr.\*

I am honored to deliver the 2010 Martin Feldstein lecture. It is especially appropriate that I will be discussing the issue of retirement security, because throughout the course of his distinguished career, Martin Feldstein has improved our understanding of the U.S. Social Security system and of retirement policy more broadly.

We clearly are at a pivotal moment in the national discussion on retirement security. Over the past 30 years, the responsibility for funding retirement and the associated risks have shifted from employers to individuals. Today, Americans are recovering from a deep plunge in financial markets and a recession that left people less confident about their ability to achieve financial security.

In discussing the future of retirement security in America, I will examine how we arrived at the current situation, outline a few core features that could be built into a retirement security plan or system, and consider the question that is increasingly asked by researchers: how can we design retirement plans that increase the likelihood of generating an adequate and secure lifetime income?

### The Changing Retirement Landscape

The contours of the U.S. retirement system have changed substantially over the past few decades, as the defined benefit pension systems that previous generations relied on for secure retirement income have become increasingly rare. According to the Employee Benefits Research Institute, only 33 percent of employees working for large and medium businesses had access to a defined benefit pension plan in 2008 — down from 84 percent 30 years ago.<sup>1</sup> In their place, a patchwork of individual accounts has placed greater responsibility and risk on individual workers.

Initially envisioned as a way for Americans to supplement

*\* Roger W. Ferguson is President and Chief Executive Officer of TIAA-CREF. This is a written and abbreviated version of the Martin Feldstein Lecture given on July 28, 2010. A video of the full lecture is at [http://www.nber.org/feldstein\\_lecture\\_2010/feldsteinlecture\\_2010.html](http://www.nber.org/feldstein_lecture_2010/feldsteinlecture_2010.html)*

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the pensions made available by their employers, 401(k) plans have instead become most workers' primary means of saving for retirement. As a result, 401(k)-type products have fostered a focus on asset accumulation rather than income in retirement.

The decline in financial markets in 2008 and the ensuing global recession have caused many Americans — especially those nearing retirement — to question whether they will be financially secure after they stop working. Indeed, can they stop working and enjoy anything approaching the standard of living to which they are accustomed?

The evidence is mixed, but for many people the answer seems to be no. Last year, research from McKinsey and Company found that the average American couple will face a savings gap of \$250,000 at the time of retirement.<sup>2</sup>

Why has the 401(k) framework failed to adequately prepare workers for retirement? Its shortcomings include:

- Lack of participation among many eligible workers;
- Insufficient employer and employee contributions;
- The failure or inability of many participants to implement an appropriate asset allocation strategy;
- The failure to preserve assets for retirement;
- And a lack of annuitization of accumulated assets in retirement to produce a lifelong income stream.

Fundamentally in the 401(k) context, retirement risk burdens — funding, investment, longevity, and mortality — fall disproportionately, often entirely, upon workers who are not equipped to manage such risks.

On the other hand, employers have benefited over the past three decades by jettisoning defined benefit pensions. For instance, it was only by reshaping their retiree health and savings plans that the big three U.S. auto manufacturers could avoid extinction. And in the public sector, where defined benefit plans are still common, employers are encouraging newly hired workers to select defined contribution retirement options.

While the decline of defined benefit pensions and the rise of defined contribution plans have removed an element of security from most Americans' retirement equation, the resulting individualized retirement system is more closely aligned with the way Americans work today.

With more frequent job changes, including spells of independent work, it makes less sense for Americans to have their retirement savings tied to a single employer.

So, three facts emerge:

- First, defined benefit pension plans proved too expensive for the vast majority of American businesses, and the tide now appears to be turning in the public sector as well;
- Second, defined contribution retirement plans, which shift responsibility to individuals, offer less security than defined benefit plans and put much emphasis on asset accumulation rather than retirement income planning;
- And third, Americans' work patterns have changed, so that portability and individual control are attractive to workers.

Given these facts, the challenge for policymakers, financial services companies, economists, and employers is how to design retirement systems that offer flexibility and individual choice, yet still provide genuine security to individual savers. In a sense, these retirement plans would be grounded in the realities of the present, while incorporating a measure of security associated with the past.

## Core Elements of Retirement Security

Which factors are most critical to enjoying a secure retirement? While there are many individual needs, three elements are core: sufficient retirement plan funding by participants and sponsors; appropriate diversification and asset allocation; and guaranteed lifetime income in the form of a low-cost, relatively transparent annuity.

### *Sufficient Funding*

Recent research has clearly demonstrated the overriding importance

of retirement plan contribution levels relative to other factors for ensuring an adequate level of retirement income.<sup>3</sup> Workers who want to maintain a standard of living close to what they enjoy at the end of their working years should be aiming to replace at least 70 percent of their final salary in retirement. This means that individuals should save at least 10–15 percent of their gross annual income, measured by the combined contribution of both employers and employees.

Currently, contributions average less than 6 percent of pay for non-highly compensated workers and 7 percent for highly compensated workers. Sponsor contributions average about 3 percent of wages.<sup>4</sup> Half of American workers do not have access to an employer-sponsored plan. Among those who don't have a workplace retirement plan, fewer than 10 percent have an individual account, such as a traditional or Roth IRA.

Asset retention is another concern. Savings can only grow if they remain in the plan. Because they allow for loans, hardship withdrawals, and lump-sum distributions when workers change jobs, 401(k) plans are replete with opportunities for savings to leak out and be used for other purposes.

A major expense looming for retirees — one that requires advanced planning and saving — is health care. Without an employer-sponsored health plan, a couple retiring at age 65 today is projected to need between \$200,000 and \$800,000 to supplement Medicare and cover out-of-pocket health care expenses during retirement.<sup>5</sup> That is a staggering sum for most people — and it reinforces the need to accumulate adequate savings for retirement.

### *Appropriate Diversification and Asset Allocation*

The second core element of a retirement security plan is appropriate diversification and asset allocation. Fifteen to 20 fund options typically give savers the ability to create

well-diversified investment portfolios. More choices could be confusing and might actually lead people to choose less-diversified investments.<sup>6</sup>

Workers often lack the knowledge to choose appropriate investments and to diversify their savings. Olivia Mitchell of the Wharton School and Stephen Utkus of Vanguard have written that plan participants tend to use “a naïve heuristic (avoid extremes, pick the middle option) rather than maintain a consistent set of well-ordered risk preferences to select from the investments offered.”<sup>7</sup>

Participant confusion underscores the need for reliable, independent advice. Historically, there has been a legislated firewall between plan administration and plan advice. Recent legislative and regulatory changes have lowered the firewall and, as a result, the defined contribution market has been moving to provide individualized investment advice. The percentage of 401(k) plans offering investment advisory services has increased from 37 percent in 2005 to about 50 percent in 2009.<sup>8</sup>

### *Guaranteed Income*

The third core element of a retirement security plan is guaranteed lifetime income.<sup>9</sup> Guaranteed income in the form of annuities — whose guarantee is subject to the claims-paying ability of the insurance company writing the contract — could re-introduce the element of security that has been missing from most private sector 401k plans for the past three decades.

Annuities can be made available within a retirement plan as an accumulation vehicle, as a distribution option upon retirement, or through both the accumulation and distribution phases. Individuals also have the option of purchasing an annuity outside their retirement plan.

A good rule of thumb is to annuitize at least enough savings, so that, combined with Social Security, a retiree will have an income stream to meet his or her basic expenses in

retirement—housing, utilities, taxes, food, and health care to the extent those costs are knowable. In addition, ideally the value of these annuitized payments should be protected—at least partially—against erosion by inflation.

Incorporating these three core elements—sufficient funding, appropriate asset allocation, and guaranteed income—into retirement plans would enhance efforts to help all Americans save for a secure retirement.

### ***Behavioral Aspects of the Retirement Challenge***

Even if we design retirement plans that encourage sufficient savings, appropriate diversification, and opportunities to turn savings into guaranteed income, will individuals take advantage of these options?

Behavioral economists have been examining how system design can influence participant behavior. Much of the literature has focused on overcoming, or leveraging, apparently negative tendencies—such as inertia and risk aversion—with new plan features and approaches, including auto-enrolling workers in a plan and framing choices in a way that motivates optimal decision making.

According to the Government Accountability Office, auto-enrollment can increase participation rates to as high as 95 percent.<sup>10</sup> The Employee Benefits Research Institute reports that auto-enrollment has increased the number of near-retirees who are on track to have enough money to pay for basic expenses and health care costs—from about 41 percent in 2003 to a little over half today.<sup>11</sup>

However, automatically enrolling individuals in a retirement plan is not necessarily a panacea. Some research has suggested that while participation rates increase when employers auto-enroll employees, the default contribution levels tend to be fairly low, and employees often remain at these low contribution levels and in very con-

servative funds.<sup>12</sup> To overcome this second-stage inertia, plan sponsors increasingly are adopting auto-escalation policies: automatically increasing an individual's contribution rate over time.

One such effort is the Save More Tomorrow program, developed by Richard H. Thaler of the University of Chicago and UCLA's Shlomo Benartzi. The program allows workers to schedule automatic increases in their savings rate for future dates. In Thaler and Benartzi's first case study, participants increased their set-aside rate from 3.5 percent to more than 13 percent. Benartzi recently has written that more than half of large employers in the United States now offer the program.<sup>13</sup>

If we accept that at least partial annuitization—or the purchase of guaranteed lifetime income—is the optimal choice for people entering retirement, how can we influence their decision-making and encourage them to move in that direction? Employers have been reluctant to include annuities as a distribution option. And, all 401(k) plans offer a lump-sum distribution option, but only 14 percent offer the ability to annuitize assets.<sup>14</sup> A commonly cited reason for plan sponsors' reluctance to offer annuities is fiduciary uncertainty. Regulatory clarity could go some way toward encouraging more employers to make annuities available.

If annuities are more widely available, will employees purchase them? Paul Yakoboski of the TIAA-CREF Institute has found that retirees who have annuitized their retirement savings are more than twice as likely, compared with retirees who have not annuitized, to have saved through an annuity in a defined contribution plan while working. Furthermore, recommendations of financial advisors have a measurable impact on the decision to annuitize.<sup>15</sup>

Jeffrey Brown of the University of Illinois and his collaborators have explored how the decision to annui-

tize is affected by the way the choice is framed. According to their research, survey participants are more than three times as likely to prefer a life annuity to a savings account when the choice is framed in consumption terms rather than in investment terms. They explain: "When consumers think in terms of consumption, they perceive the life annuity as offering valuable insurance against the risk of outliving one's resources. However, when they think in investment terms, they view life annuities as increasing risk without increasing return, because of the potential for variation in the total value of payments based on how long they live."<sup>16</sup>

The desire to avoid what is perceived as a loss has been identified as a powerful motivator for individuals. Recently, Columbia University's Eric Johnson uncovered what he calls "hyper loss aversion" among retirees, who were up to five times more loss averse than the average person.<sup>17</sup> Interestingly, this hyper sensitivity to loss does not translate into a desire to purchase guaranteed income. Instead, Johnson has found, retirees who exhibit hyper loss aversion are *less* likely to annuitize because they see giving up immediate control of their savings as another type of loss.

### **The Need for Further Research**

Despite actions taken to increase savings and highlight the benefits of guaranteed income, a distressingly large fraction of people pay little heed. Annamaria Lusardi of Dartmouth College and Jason Beeler of Harvard University found that in the year before the financial crisis, 30 percent of Baby Boomers—the people closest to retirement—had given no thought to retirement planning.<sup>18</sup>

How can we reach the nonplanners? And how can we reach more of the individuals who are planning, but who lack the knowledge to make informed decisions and may feel paralyzed by the process? We need fur-

ther research to drive innovations in retirement plan design, to aid policymakers in strengthening the legal and regulatory framework that supports retirement planning, and to cultivate broader financial knowledge in America.

Among the questions needing further exploration:

- What is the appropriate mix of automatic plan features with education or advice?
- At what point in a career is it advisable for a participant to stop being an “auto-bot” and become a planner who saves and invests according to his or her plan?
- And how much of their income should people save? Consensus on this figure has been elusive, but if we can clarify the goal for most workers, we may have more success in helping people reach that benchmark.

Economists are making an essential contribution to the future of retirement by exploring not only how rational people *should* act given a certain set of facts, but also how they *do* act, as individuals prone to biases, passions, and proclivities that are perhaps even more determinative of their actions than reason is. With a clear view of the possibilities and limitations of retirement plan design and a stronger understanding of how people make financial decisions, we can point the way toward a more secure financial future.

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<sup>1</sup> EBRI Databook on Employee Benefits, *Chapter 10: Aggregate Trends in Defined Benefit and Defined Contribution Retirement Plan Sponsorship, Participation, and Vesting*, updated December 2009.

<sup>2</sup> “Restoring Americans’ Financial

*Security: A Shared Responsibility,” McKinsey & Company, October 19, 2009.*

<sup>3</sup> Brett P. Hammond and David P. Richardson, “A New Look at Retirement Savings and Adequacy: Individual Investment Risk Management and the Asset Salary Ratio,” prepared for the Pension Research Council Annual Meeting, April 30, 2009.

<sup>4</sup> 51st Annual Survey of Profit Sharing and 401(k) Plans, Profit Sharing/401k Council of America, 2008.

<sup>5</sup> Employee Benefit Research Institute (EBRI), June 2009.

<sup>6</sup> Roderick Crane, Michael Heller, and Paul J. Yakoboski, “Defined Contribution Pension Plans in the Public Sector: A Best Practice Benchmark Analysis,” TIAA-CREF Institute, April 2008.

<sup>7</sup> Olivia S. Mitchell and Stephen P. Utkus, “Lessons from Behavioral Finance for Retirement Plan Design,” in *Pension Design and Structure: New Lessons in Behavioral Finance*, O.S. Mitchell and S.P. Utkus, eds., Oxford University Press, July 2004.

<sup>8</sup> Hewitt Associates, “Trends and Experience in 401(k) Plans,” 2009 survey.

<sup>9</sup> *Lifetime income is a guaranteed stream of income subject to the claims-paying ability of the issuing insurance company.*

<sup>10</sup> U.S. Government Accountability Office, “Retirement Savings: Automatic Enrollment Shows Promise for Some Workers, but Proposals to Broaden Retirement Savings for Other Workers Could Face Challenges,” report GAO-10-31, October 23, 2009.

<sup>11</sup> The EBRI Retirement Readiness Rating™: Retirement Income Preparation and Future Prospects, Issue Brief No. 344, July 2010.

<sup>12</sup> J.J. Choi, D.Laibson, B. C.

Madrian, and A. Metrick, “For Better or For Worse: Default Effects and 401(k) Savings Behavior,” NBER Working Paper No. 8651, December 2001.

<sup>13</sup> Shlomo Benartzi, “Behavioral Finance and the Post-Retirement Crisis,” introduction to Behavioral Finance and the Post-Retirement Crisis, prepared and submitted on behalf of Allianz in response to Department of the Treasury/ Department of Labor Request for Information regarding lifetime income options in retirement plans, April 2010.

<sup>14</sup> Hewitt Associates, “Trends and Experience in 401(k) Plans,” 2009 survey.

<sup>15</sup> Paul J. Yakoboski, “Retirees, Annuitization, and Defined Contribution Plans,” TIAA-CREF Institute, April 2010.

<sup>16</sup> Jeffrey R. Brown, Jeffrey R. Kling, Sendhil Mullainathan, and Marian V. Wrobel, “Framing and Annuities,” TIAA-CREF Institute, January 2009.

<sup>17</sup> Shlomo Benartzi, “Hyper Loss Aversion: Retirees Show Extremely High Sensitivity to Loss, But Shy Away from Guarantees that Require Giving Up Control” based on interview with Eric Johnson in Behavioral Finance and the Post-Retirement Crisis, prepared and submitted on behalf of Allianz in response to Department of the Treasury/ Department of Labor Request for Information regarding lifetime income options in retirement plans, April 2010.

<sup>18</sup> Annamaria Lusardi and Jason Beeler, “Saving Between Cohorts: The Role of Planning,” in *Redefining Retirement: How Will Boomers Fare?* B.C. Madrian, O.S. Mitchell, and B.J. Soldo, eds. Oxford University Press, 2007.

# Improving the Life Chances of Disadvantaged Children

Jens Ludwig\*

Improving the schooling outcomes for disadvantaged children is central to efforts to reduce overall inequality and for increasing economic growth. Around 78 percent of white high school students graduate within four years, compared to 58 percent of Hispanics and 55 percent of blacks.<sup>1</sup> In the federal government's 2007 National Assessment of Educational Progress, only 16 percent of fourth-grade students who were eligible for free lunch scored at proficient levels in reading, compared with 44 percent of those with higher family incomes.<sup>2</sup> These large disparities understandably have intensified concern about how to improve our system of public schools.

The possibility that some of the most effective ways to improve school outcomes might not have anything to do with elementary or secondary schools first was raised in a landmark 1966 study named after its lead investigator, the distinguished sociologist James S. Coleman.<sup>3</sup> The "Coleman Report" made several remarkable claims, including: the black-white gap in school "inputs" was much smaller than generally perceived; school inputs were only weakly correlated with student test scores; among the strongest correlates of test scores were family background and the socio-economic composition of the child's school; and, disparities in test scores open up very early in life, so that for example the black-white test score gap was already 1.5 standard deviations by first grade. Subsequent studies have shown that these disparities are

evident in the pre-school years, in part because of disparities in early learning environments. By age three, children in professional families have larger vocabularies than the *parents* of children in families on welfare.<sup>4</sup>

My research and that of other NBER family members suggests that segregation, poverty, and other aspects of the out-of-school environment, particularly early in life, indeed seem to matter for children, but apparently more so for behavioral outcomes like schooling attainment and criminal behavior than for achievement test scores.

## Social Context

Since at least the 1920s, social scientists have thought that child development may be heavily influenced by the child's social context, including the interactions with peers that shape the returns to different behaviors, the information that local adult role models convey about the value of schooling and formal labor market involvement, and the quality of local institutions such as schools and police. These beliefs are consistent with the substantial cross-sectional variation observed in children's learning and other outcomes across schools and neighborhoods of differing socio-economic and racial compositions. Yet in practice, isolating the causal effects of social context on children's life chances has been quite difficult because of the endogenous sorting of families across schools and neighborhoods.

To identify and estimate the causal effects of neighborhoods on children and families, the U.S. Department of Housing and Urban Development

(HUD) sponsored the Moving to Opportunity (MTO) residential mobility experiment. Started in 1994 in five cities (Baltimore, Boston, Chicago, Los Angeles, and New York), MTO enrolled a sample of 4600 public housing families with children and via random lottery offered some families the chance to use a housing voucher to move into a less distressed neighborhood. Random assignment in MTO generated very large changes in neighborhood conditions among otherwise comparable groups of families. For example, families with MTO vouchers moved into census tracts with average poverty rates of just 12 percent in the year 2000, much lower than the average baseline tract's poverty rate of 50 percent.

Data collected on MTO families about five years after a baseline revealed no detectable differences in average achievement test scores across randomly assigned MTO mobility groups. However, my study with Jeffrey Kling and Lawrence Katz shows that arrest rates for violent crime among youth who relocated through MTO were around 40 percent lower than those for youth in the control group.<sup>5</sup> MTO also reduced arrest rates for other types of crimes among young females, but it seems to have increased property-crime arrests for young males. Other studies using data from randomized public-school choice lotteries also have found that moving to a higher-quality or less segregated school has more pronounced effects on behavioral outcomes, like crime, than on achievement test scores. However, the school choice studies do not find signs of adverse effects on property offending or other criminal behaviors of male youth.<sup>6</sup>

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\*Ludwig is a Research Associate in the NBER's Program on Children and a professor at the University of Chicago. His Profile appears later in this issue.

These various studies of randomized housing-voucher or school-choice lotteries identify partial-equilibrium effects by focusing on those who move to a new social context. To learn more about the general-equilibrium effects on crime from large-scale government efforts to re-sort people across social contexts, David Weiner, Byron Lutz, and I study the largest and arguably most important policy initiative in this area: court-ordered school desegregation, which has been of increasing interest to economists in recent years.<sup>7</sup> Most of the nation's largest urban districts were forced to desegregate by local federal court order; differences across these districts in the timing of the court orders provide our source of identifying variation. Our analysis suggests that re-sorting children across social settings is not just a zero-sum game. Court-ordered school desegregation seems to generate substantial declines in homicide victimization and offending among black youth and, interestingly, seems to generate beneficial spillovers to other groups as well (such as whites and black adults), at least in the short term.

### Early Childhood Education

Early disparities in children's outcomes and the possibility that certain learning can take place only at specific times in a child's development have generated considerable interest in early childhood interventions. Because getting parents to behave in more developmentally productive ways seems to be quite difficult in practice, most of the policy attention has been devoted to center-based early childhood education (ECE) programs. Intensive, small-scale model programs from the 1960s and 1970s—such as Perry Preschool and Carolina Abecedarian—have been shown to improve important adult economic and other outcomes, despite some “fade out” in test score gains. While these programs seem to generate benefits far in excess of their costs,<sup>8</sup> there remains the important policy question of whether these small-scale

model programs can be taken to scale effectively.

Head Start is the main example of such a scaled-up program, and has consistently generated debate about whether it produces lasting benefits to program participants. Head Start was launched in 1965 by the Office of Economic Opportunity (OEO) and provides low-income children aged 3–5 years, and their parents, with schooling, health, nutrition, and social welfare services. The first study arguing that Head Start benefits to children fade out rapidly was released in 1966, which meant there was a very short honeymoon period. The main concern with that early study, and many subsequent ones, is the possibility that relatively more disadvantaged families may select (or be selected) into program participation, so that naïve regressions that simply compare participants and non-participants may understate the benefits of the program.

My work on Head Start with Douglas Miller tries to identify its causal effects on children's life outcomes by taking advantage of a discontinuity in program funding across counties that resulted from the way the OEO initially implemented the program.<sup>9</sup> During the spring of 1965, OEO provided technical assistance to the 300 poorest counties in the United States to develop Head Start funding proposals. We show that program funding and participation rates are 50–100 percent higher in counties with poverty rates just above OEO's cutoff (the “treatment” group) than in those just below (the control group). This funding difference, which is the key to our regression discontinuity (RD) research design, appears to have persisted through the late 1970s. The estimated discontinuity in other federal social spending is small and not significant.

Our main finding is that this large “jump” in Head Start funding at the OEO threshold is mirrored in a large “drop” in mortality rates to children 5 to 9 years of age over the period 1973–83 from causes addressed as part of

Head Start's health services. Our estimates imply that a 50–100 percent increase in Head Start funding reduces mortality rates from relevant causes by 33–50 percent of the control mean, enough to drive mortality rates from these causes in the treatment counties down to about the national average. There do not appear to be drops for other causes-of-death or birth cohorts that should not be affected by Head Start. We also find suggestive evidence of a “jump” at the OEO threshold in educational attainment, but no statistically significant discontinuities in achievement test scores measured during middle school.<sup>10</sup>

### Implications for Policy and Next Steps

The growing body of research about the beneficial effects on disadvantaged minority children from reducing segregation of schools and neighborhoods is relevant to ongoing policy and legal debates about government efforts in this area. While there would be great value in learning more about the general-equilibrium effects of large scale re-sorting policies, the evidence we have to date suggests that helping poor families move out of high-poverty high-rise public housing projects may help to improve at least certain aspects of child well-being.

What else policy might do to reduce the segregation of low-income minority children in schools or neighborhoods is not clear. While many public housing families appear eager to move to less-distressed areas when given the chance, some of my ongoing work with Brian Jacob suggests that other low-income families who are already in the private housing market are reluctant to move out of their old neighborhoods, even when provided with large rental subsidies. Re-sorting children across schools without changing residential patterns is difficult given how segregated our cities are, and given past U.S. Supreme Court decisions that make it extremely difficult to re-sort children across school



district boundaries. Consider, for example, that in the Chicago Public School system, just 9 percent of students are white, and fully 86 percent of students are eligible for free or reduced price lunches.

Whether local, state, or federal governments will increase investments in early childhood education despite their current budget difficulties remains to be seen. At least as important for public policy is the question of whether Head Start is as beneficial for today's poor children as it was in the past. In principle, the net effects of Head Start may have changed over time, as the developmental quality of the program and its alternatives have changed substantially.

The federal government recently sponsored a randomized experimental study of Head Start that found impacts on test scores measured at the end of the program year on the order of 0.1 to 0.2 standard deviations. These results led to considerable criticism of Head Start for not doing more to eliminate the test score gap between minority and white children or between rich and poor. But Deborah Phillips and I note that these initial impacts are about the same as what was found for previous cohorts of children, for whom we observed lasting benefits into adulthood.<sup>11</sup> More puzzling are the latest results from the experiment's first-grade follow-up, which showed almost complete "fade out" of these initial gains—a more rapid decline in Head Start effects than what was observed for previous cohorts of program participants.

The recent Head Start experiment highlights the great value for social policy in learning more about the mapping between short- and long-term ECE impacts. Ideally, we would be able to use short-term effects from ECE studies in a manner analogous to what medical researchers call "surrogate clinical endpoints" (for example, using changes in blood cholesterol levels to understand effects on long-term risk for cardiovascular disease). It would certainly

be less than ideal to have to wait 30 or 40 years to understand the long-term effects of today's early childhood interventions.

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<sup>1</sup> C.B. Swanson, *Cities in Crisis, 2009 — Closing the Graduation Gap: Educational and Economic Conditions in America's Largest Cities, Bethesda, MD: Editorial Projects in Education, 2009.*

<sup>2</sup> The Nation's Report Card, *Reading 2007: National Assessment of Educational Progress at Grades 4 and 8, National Center for Education Statistics 2007-496, Washington, DC: U.S. Department of Education, Institute for Educational Sciences, 2007.*

<sup>3</sup> J.S. Coleman, E. Q. Campbell, C.J. Hobson, et al, *Equality of Educational Opportunity, Washington, DC: Office of Education, U.S. Department of Health, Education, and Welfare, 1966.*

<sup>4</sup> B. Hart and T. Risley, *Meaningful Differences in the Everyday Experience of Young American Children, Baltimore, MD: Paul Brooks, 1995.*

<sup>5</sup> See L. Sanbonmatsu, J.R. Kling, G.J. Duncan, and J. Brooks-Gunn, "Neighborhoods and Academic Achievement: Results from the Moving to Opportunity Experiment", *NBER Working Paper No. 11909, January 2006, and Journal of Human Resources, XLI, (2006), pp. 649–91; J.R. Kling, J. Ludwig, and L.F. Katz, "Neighborhood Effects on Crime for Female and Male Youth: Evidence from a Randomized Housing Voucher Experiment", NBER Working Paper No. 10777, September 2004, and Quarterly Journal of Economics, 120(1), (2005), pp. 87–130.*

<sup>6</sup> See J.B. Cullen, B.A. Jacob, and S. Levitt, "The Effect of School Choice on Student Outcomes: Evidence from Randomized Lotteries", *NBER Working Paper No.10113, November 2003, and Econometrica 74(5) (2006), pp.1191–1230; and D. Deming, "Better Schools, Less Crime?" working paper, Carnegie-Mellon University, 2009.*

<sup>7</sup> D.A. Weiner, B.F. Lutz, and J. Ludwig, "The Effects of School Desegregation on Crime", *NBER Working Paper No. 15380, September 2009. See also, for example, J. Guryan, "Desegregation and Black Dropout Rates," NBER Working Paper No. 8345, June 2001, and American Economic Review, 94(4) (2004), pp. 919–43.*

<sup>8</sup> See, for example, C.R. Belfield, M. Nores, W.S. Barnett, and L. Schweinhart, "The High/Scope Perry Preschool Program: Cost-Benefit Analysis Using Data from the Age-40 Follow-up," *Journal of Human Resources, XLI(1), (2006), pp.162–90; and W.S. Barnett and L.N. Masse, "Comparative Benefit-Cost Analysis of the Abecedarian Program and its Policy Implications," Economics of Education Review, 26, (2007), pp. 113–25.*

<sup>9</sup> J. Ludwig and D.L. Miller, "Does Head Start Improve Children's Life Chances? Evidence from a Regression Discontinuity Design", *NBER Working Paper No.11702, October 2005, and Quarterly Journal of Economics, 122(1) (2007), pp. 159–208.*

<sup>10</sup> See also J. Currie and D. Thomas, "Does Head Start Make a Difference?", *NBER Working Paper No.4406, July 1003, and American Economic Review, 85(3) (1995), pp. 341–64; E. Garces, D. Thomas, and J. Currie, "Longer Term Effects of Head Start," NBER Working Paper No. 8054, December 2000, and American Economic Review, 92(4) (2002), pp. 999–1012; and D. Deming, "Early Childhood Intervention and Life-Cycle Skill Development: Evidence from Head Start," *American Economic Journal: Applied Economics, 1(3) (2009), pp. 111–34.**

<sup>11</sup> J. Ludwig and D.A. Phillips, "The Benefits and Costs of Head Start", *NBER Working Paper No.12973, March 2007, and Society for Research in Child Development Social Policy Report, 21(3) (2007), pp. 3–18.*

# The Determinants of Individual Saving and Investment Outcomes

Brigitte C. Madrian\*

Over the past 30 years, employer provided defined contribution (DC) savings plan largely have displaced traditional defined benefit (DB) pensions in the private sector. In 1975, there were 2.4 active defined benefit plan participants for each participant in a private sector defined contribution savings plan. By 2007, these proportions had almost reversed, with 3.4 active defined contribution savings plan participants for each defined benefit plan participant. As this shift puts more and more individuals in the position of having to self-manage the process of saving for retirement, a natural question is just how well are individuals doing, and what factors affect their retirement saving outcomes. My research over the past several years has tried to address these broad questions.

## Institutional Features and Savings Outcomes

Much of my recent research evaluates the effects of different institutional features on individual savings and investing outcomes. One example of such a feature is the default—that is, what happens if an individual does nothing? As an example, in a typical employer-sponsored savings plan, individuals are only enrolled if they *actively* elect to join the plan: the default is non-participation. Some companies, however, have a different default—they automatically enroll employees in their savings plan unless employees actively opt-out.

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My research with several different collaborators, most notably David Laibson, James Choi, Andrew Metrick, and John Beshears, shows that changes in the nature of savings plan defaults have a tremendous impact on realized outcomes. We examine savings plan participation rates for employees hired before and after several firms instituted automatic enrollment and find that participation is substantially higher under automatic enrollment.<sup>1</sup> One concern with automatic enrollment is that it may “coerce” employees into savings plan participation. If so, we would expect that many participants under automatic enrollment should eventually opt out of the savings plan. But we observe very low attrition rates under either an opt-in or an opt-out participation regime. High participation rates and low attrition rates under automatic enrollment suggest that most employees do not object to saving for retirement. In the absence of automatic enrollment, however, many simply delay joining their savings plan.

Interestingly, the impact of automatic enrollment on savings plan participation is not very dependent on the existence or generosity of an employer match.<sup>2</sup> This finding is significant because many extensions of automatic enrollment (for example, the recently adopted KiwiSaver program in New Zealand, or the Automatic IRA proposals in the United States) do not require an employer match but nonetheless allow individuals to opt out.

Automatic enrollment also affects savings plan contribution rates and asset allocations. In an opt-in regime, employees must choose a contribution rate and asset allocation when they enroll. Under automatic enrollment, the company specifies a default con-

tribution rate and asset allocation for employees who don't actively choose otherwise. In companies without automatic enrollment, the modal contribution rate tends to be the match threshold (the contribution rate at which employees receive the full employer match). In contrast, the modal contribution rate of participants hired under automatic enrollment is the automatic enrollment default chosen by the company (initial defaults of 2 percent or 3 percent of pay, usually below the match threshold, are typical). This shift in the modal contribution rate is driven not only by the increased participation generated by automatic enrollment (which moves people from zero to a positive contribution rate), but also by individuals who would have otherwise contributed at a higher rate but who instead remain at the automatic enrollment default.

Similar patterns hold with respect to asset allocation. A large fraction of savings plan participants stick with the employer-chosen default asset allocation under automatic enrollment, even when the default is an allocation that very few savings plan participants actively elected prior to automatic enrollment. Asset allocation defaults also matter outside the context of automatic enrollment; in companies that direct matching contributions to employer stock, very few employees actively change their allocation ex post, even when they have the ability to do so.<sup>3</sup>

Why do defaults have such a persistent effect on outcomes? One explanation is that the default is perceived as an endorsement of a particular outcome. There is some evidence consistent with this notion.<sup>4</sup> First, savings plan participants who were themselves not affected by automatic enrollment

are more likely to have an asset allocation that mirrors the automatic enrollment default in effect for more recently hired employee cohorts if they themselves did not elect savings plan participation until after automatic enrollment was adopted. Second, savings plan participants who were subject to automatic enrollment but who take action to move away from the automatic enrollment default have asset allocation outcomes that are closer to the default portfolio than do participants not affected by automatic enrollment—that is, their movement away from the default is complete.

A second explanation for the persistence of defaults is that opting-out of a default may be cognitively difficult. For example, initiating savings plan participation in the absence of automatic enrollment is a complicated choice that involves electing both a contribution rate and an asset allocation. Automatic enrollment simplifies this decision by decoupling participation from these other ancillary choices. Evidence that such complexity matters comes from two recent papers that evaluate a low-cost manipulation called “Quick Enrollment”. This intervention reduces the complexity of savings plan enrollment by allowing employees to elect participation at a contribution rate and asset allocation pre-selected by their employer.<sup>5</sup> At one company studied, Quick Enrollment tripled participation among new hires relative to a standard opt-in regime. When Quick Enrollment was made available to previously hired employees who were not participating in their savings plan at two different firms, the subsequent enrollment rates of these non-participants increased by 12 to 25 percentage points relative to what would have been predicted in the absence of the intervention.

In many settings, it is hard to avoid having a default outcome. One alternative, however, is to require individuals to make an active choice for themselves—an “active decision.” In the context of employer-sponsored savings

plans, such an approach also influences outcomes relative to the typical norm of non-participation. For example, research on a company that changed its savings plan enrollment regime from one that required employees to fill out a form either *affirmatively* electing or *affirmatively* rejecting savings plan participation to a “standard enrollment” (for example opt-in) regime finds that savings plan participation three months after hire declined from approximately 70 percent (when an active decision was required) to approximately 40 percent (when no active decision was required).<sup>6</sup>

Requiring an active decision has an impact on asset allocation outcomes as well. In a recent paper, Choi, Laibson, and I<sup>7</sup> study a company at which employer matching contributions were originally made in the form of employer stock, but with no restrictions on subsequent diversification. At some point, the firm decided to require employees instead to explicitly choose their own asset allocation for matching contributions upon enrollment in the plan (this allocation could differ from that chosen for employees’ own contributions). Because there were no constraints on trading out of employer stock before this active decision was required, savings plan participants could effect the same asset allocation for matching contributions under either regime. In practice, however, very few participants in the initial matching regime ever actively reallocated their match balances; in contrast, under the active decision regime, participants tended to choose an asset allocation for their matching contributions that largely mirrored that chosen for their own contributions, and overall exposure to employer stock fell dramatically as a result. In addition to highlighting the difference in outcomes that occurs under a default versus an active-decision-making regime, the results in this paper also suggest that individuals engage in mental accounting and narrow framing when making their asset allocation choices.

Compared to the effects of the different approaches to savings plan enrollment discussed above, standard economic incentives have a surprisingly *weak* impact on savings plan participation. Having an employer match *does* increase participation in a savings plan, but many eligible employees still fail to sign up in the absence of automatic enrollment even with such a match.<sup>8</sup> Choi, Laibson, and I examine a group of workers who face particularly strong financial incentives for savings plan participation: employees over the age of 59 ½ who are vested, who have an employer match, and who, by virtue of their age, can make unrestricted savings plan withdrawals with no tax penalty. Even for this group, we find that a sizeable fraction (20 percent to 60 percent in the seven firms we study) fail to fully exploit the employer match, either by not participating in the savings plan or by contributing less than the match threshold. We conclude that employer matching is less effective at increasing savings plan participation than other institutional approaches, such as automatic enrollment or requiring an active decision.

An employer match has its most significant effect on the *distribution* of contribution rates rather than on participation. Savings plan contribution rates are heavily influenced by the employer-chosen match threshold.<sup>9</sup> For example, in one firm that increased its match threshold from 5–6 percent of pay to 7–8 percent of pay, the fraction of new participants choosing to save 7–8 percent increased from 8 to 33 percent of participants, whereas the fraction of new participants choosing to save 5–6 percent of pay decreased from 43 to 19 percent.

## Information Provision and Savings Outcomes

Information provision and education also can be useful in influencing individual behavior, and the savings domain is no exception. In a series of papers with different collaborators, I

examine the impact of information on savings and investment outcomes. These papers find that information provision alone is often not very effective, and that sometimes individuals can respond to information in perverse ways.

In an analysis with Choi, Laibson, and Andrew Metrick of an employer-sponsored financial education initiative, we find that compared to non-attendees, employees who attend financial education seminars are more likely to sign up for their employer's savings plan, to increase their contribution rate, and to make changes to their asset allocation.<sup>10</sup> The magnitude of these effects, however, is small, both in an absolute sense, and compared to employees' intentions regarding their future behavior after attending the seminars.

In another study, Choi, Laibson, and I study the impact of information provision from the news media using a natural experiment: the media barrage on the risk of being over-invested in employer stock that followed the corporate accounting scandals and stock market decline of 2000–1 (and which has become relevant once again following the more recent market decline).<sup>11</sup> Three companies received particular attention over that time period: Enron, WorldCom, and Global Crossing. For example, the *New York Times* ran 1,364 stories on Enron during the last quarter of 2001 and the first quarter of 2002, of which 112 ran on the front page. We show that employer stock holdings in other companies' savings plans fell by only a small amount as a result of the newsmedia. Even in Houston — Enron's headquarters — where the *Houston Chronicle* ran 1,122 stories on Enron in the six months surrounding the firm's collapse, employees at other companies did not diversify their employer stock holdings. These results are consistent with individual inertia (as described above), and also with a mistaken perception on the part of individuals that their employer's stock is less risky other equity investments.

Investment prospectuses are another source of information for individual investors. In an investing experiment, Choi, Laibson, and I evaluate the impact of information salience on investment outcomes.<sup>12</sup> Subjects were asked to allocate a hypothetical \$10,000 across four S&P 500 index funds. Subjects were randomized across three information conditions: prospectuses only (control), prospectus plus a short summary of the fees charged by the mutual funds, or prospectus plus a short statement of the returns since inception attained by the mutual funds. The two treatment conditions reduce information gathering costs and increase the salience of either fees or returns since inception, because both of these variables are reported in the prospectus. Subject payments were tied to the actual performance of the chosen portfolio. Because payments were made by the *experimenters*, services like financial advice were effectively unbundled from portfolio returns. And, because all of the mutual funds in the choice set had the same objective, that is to mimic the returns of the S&P 500 index, the surest way to maximize returns was to choose the fund with the lowest fees. We find that subjects overwhelmingly failed to minimize index fund fees. When fees were made salient, average portfolio fees fell, but most subjects still did not minimize fees. In contrast, when returns since *inception* (an irrelevant statistic when comparing index funds with different inception dates) were made salient, subjects chased these returns. Overall, we find small effects from the salience manipulations in this experiment, although we find these effects both for information that should normatively matter, and for information that should not.

In a related experiment, Beshears and I evaluate the effect of providing investors with a traditional investment prospectus relative to the simpler and shorter summary prospectus recently approved by the SEC.<sup>13</sup> We find that the Summary Prospectus

does not meaningfully alter subjects' investment choices relative to the longer prospectus. Average portfolio fees and past returns are similar regardless of the type of prospectus participants received. We find some weak evidence, however, that providing the Summary Prospectus makes subjects feel more confident about their portfolio choices.

And in a very recent paper, the four of us and co-author Katherine Milkman evaluate the effect of providing individuals with information on their coworkers' behavior in an employer-sponsored savings plan. We find conflicting evidence on the impact of receiving peer information. For one sub-group of workers — non-unionized non-participants — peer information increases the likelihood of subsequent savings plan enrollment. But for another sub-group of workers — unionized non-participants — we find that peer information actually reduces subsequent enrollment. The effects of so-called social norms marketing are not as predictable as some of the previous literature has suggested.<sup>14</sup>

## Market Experience and Savings Outcomes

Finally, Choi, Laibson, Metrick, and I examine the impact of previous market experience on savings outcomes. In one paper, we study the relationship between employee allocations to employer stock and past employer stock returns. We find that high past returns induce participants to allocate more of their contributions to their employer's stock.<sup>15</sup> In a second paper, we show that past returns not only impact asset allocation, but also individual savings rates.<sup>16</sup> High unpredictable and idiosyncratic lagged equity returns in an individual's portfolio predict subsequent savings rate *increases*. This contradicts the relationship predicted by standard economic theory, but can be explained by extrapolative beliefs. When investors experience high *past* returns, they forecast

high future returns. This will lead to increased savings if their elasticity of intertemporal substitution is greater than one.

<sup>1</sup> B.C. Madrian and D. Shea, "The Power of Suggestion: Inertia in 401(k) Participation and Savings Behavior", NBER Working Paper No. 7682, May 2000, and *Quarterly Journal of Economics*, 2001, 116: pp.1149–87; J. J. Choi, D. Laibson, B.C. Madrian, and A. Metrick, "For Better or for Worse: Default Effects and 401(k) Savings Behavior", NBER Working Paper No. 8651, December 2001, and in *Perspectives on the Economics of Aging*, D. A. Wise, ed., Chicago, IL: University of Chicago Press, 2004, pp. 81–121; J. Beshears, J. J. Choi, D. Laibson, and B.C. Madrian, "The Importance of Default Options for Retirement Savings Outcomes: Evidence from the United States," NBER Working Paper No. 12009, February 2006, and in *Lessons from Pension Reform in the Americas*, S. J. Kay and T. Sinha, eds., New York, NY: Oxford University Press, 2008, pp. 59–87.

<sup>2</sup> J. Beshears, J. J. Choi, D. Laibson, and B.C. Madrian, "The Impact of Employer Matching on Savings Plan Participation Under Automatic Enrollment," NBER Working Paper No. 13352, August 2007, and in *Research Findings in the Economics of Aging*, D. A. Wise, ed., Chicago, IL: University of Chicago Press, 2010, pp. 311–327.

<sup>3</sup> J. J. Choi, D. Laibson, and B.C. Madrian, "Are Empowerment and Education Enough? Underdiversification in 401(k) Plans," *Brookings Papers on Economic Activity*, 2:2005, pp. 151–198; J. J. Choi, D. Laibson, and B.C. Madrian, "Mental Accounting in Portfolio Choice: Evidence from a Flypaper Effect," NBER Working Paper No. 13656, November 2007, and *American Economic Review*, 99(5), (2009), pp. 2085–95.

<sup>4</sup> B.C. Madrian and D. Shea, "The Power of Suggestion: Inertia in 401(k)

Participation and Savings Behavior", *op. cit.*; J. J. Choi, D. Laibson, B.C. Madrian, and A. Metrick, "For Better or for Worse: Default Effects and 401(k) Savings Behavior", *op. cit.*; J. Beshears, J. J. Choi, D. Laibson and B.C. Madrian, "The Importance of Default Options for Retirement Savings Outcomes: Evidence from the United States," *op. cit.*

<sup>5</sup> J. J. Choi, D. Laibson, and B.C. Madrian, "Reducing the Complexity Costs of 401(k) Participation Through Quick Enrollment," NBER Working Paper No. 11979, January 2006, and in *Developments in the Economics of Aging*, D. A. Wise, ed., Chicago, IL: University of Chicago Press, 2009, pp. 57–82; J. Beshears, J. J. Choi, D. Laibson, and B.C. Madrian, "Simplification and Saving," NBER Working Paper No. 12659, October 2006.

<sup>6</sup> G. Carroll, J. J. Choi, D. Laibson, B.C. Madrian, and A. Metrick "Optimal Defaults and Active Decisions: Theory and Evidence from 401(k) Saving," NBER Working Paper No. 11074, January 2005, and *Quarterly Journal of Economics*, 124(4), (2009), pp. 1639–74.

<sup>7</sup> J. J. Choi, D. Laibson, and B.C. Madrian, "Mental Accounting in Portfolio Choice: Evidence from a Flypaper Effect," *op. cit.*

<sup>8</sup> For evidence on the impact of the employer matching and savings plan participation in 401(k)-like savings plans, see J. J. Choi, D. Laibson, B.C. Madrian, and A. Metrick, "Defined Contribution Pensions: Plan Rules, Participant Decisions, and the Path of Least Resistance," NBER Working Paper No. 8655, December 2001, in *Tax Policy and the Economy*, Vol. 16, J. M. Poterba, ed., Cambridge, MA: MIT Press, 2002, pp. 67–113; J. J. Choi, D. Laibson, and B.C. Madrian, "\$100 Bills on the Sidewalk: Violations of No-Arbitrage in 401(k) Accounts," NBER Working Paper No. 11554, August 2005, and forthcoming in *The Review of Economics and Statistics*; and J. Beshears, J. J. Choi, D. Laibson, and B.C. Madrian, "The Impact

of Employer Matching on Savings Plan Participation Under Automatic Enrollment," NBER Working Paper No. 13352, August 2007, and in *Research Findings in the Economics of Aging*, D. A. Wise, ed., Chicago, IL: University of Chicago Press, 2010, pp. 311–327. Also, in G. Engelhardt and B.C. Madrian, "Employee Stock Purchase Plans," NBER Working Paper No. 10421, April 2004, and *National Tax Journal*, 57(2), 2004, pp. 385–406, we document very high levels of non-participation in employer stock purchase plans, despite the fact that the financial benefits available from participation in these plans are often non-trivial as well.

<sup>9</sup> J. J. Choi, D. Laibson, B.C. Madrian, and A. Metrick, "Defined Contribution Pensions: Plan Rules, Participant Decisions, and the Path of Least Resistance," *op. cit.*

<sup>10</sup> *Ibid.*

<sup>11</sup> J. J. Choi, D. Laibson, and B.C. Madrian, "Are Empowerment and Education Enough? Underdiversification in 401(k) Plans," *Brookings Papers on Economic Activity*, 2 (2005), pp. 151–98.

<sup>12</sup> J. J. Choi, D. Laibson, and B.C. Madrian, "Why Does the Law of One Price Fail? An Experiment on Index Mutual Funds," NBER Working Paper No. 12261, May 2006, and in *Review of Financial Studies*, 23(4), (2010), pp.1405–32.

<sup>13</sup> J. Beshears, J. J. Choi, D. Laibson, and B.C. Madrian, "How Does Simplified Disclosure Affect Individuals' Mutual Fund Choices?," NBER Working Paper No. 14859, April 2009, and forthcoming in *Explorations in the Economics of Aging*, D. A. Wise, ed., University of Chicago Press.

<sup>14</sup> J. Beshears, J. J. Choi, D. Laibson, B.C. Madrian, and K. Milkman, "The Effect of Providing Peer Information on Retirement Savings Outcomes."

<sup>15</sup> J. J. Choi, D. Laibson, B.C. Madrian, and A. Metrick "Employees' Investment Decisions About Company Stock," NBER Working Paper No. 10228, January 2004, and in *Pension Design and Structure*, O. S. Mitchell

and S. P. Utkus, eds., *New York, NY: Oxford University Press, 2004, pp. 121–36.*

<sup>16</sup> J. J. Choi, D. Laibson, B.C. Madrian, and A. Metrick, “Reinforcement Learning and Savings

*Behavior,” Journal of Finance, 64(6), (2009), pp. 2515–34.*

## Trends in Time Use in Twentieth Century America

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In his 1930 essay “Economic Possibilities for Our Grandchildren,” John Maynard Keynes looked beyond the pessimism surrounding the Great Depression and predicted that rapid productivity growth would result in abundant leisure and freedom from most economic needs within a hundred years.<sup>1</sup> He speculated that the little work left to do would be shared as widely as possible, so that each person could spend about fifteen hours per week doing a few meaningful tasks.

Keynes was not alone in his belief that a new era of rising leisure was beginning. As of the 1930s, the standard factory workweek had declined significantly over the previous hundred years, appliances were reducing the drudgery of housework, and the high unemployment rates of the Great Depression had led to “forced leisure.” Numerous scholarly articles during the 1930s examined various aspects of leisure, from teaching children how to use leisure time wisely to a variety of time diary studies that recorded how individuals used their leisure.

The extent to which societies respond to productivity growth by increasing their leisure time is fundamental to numerous economic questions. For example, the size of the response affects the foundations of growth models, assessments of standards of living,

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and forecasts of long-term labor supply behavior.

U.S. labor productivity rose eight-fold during the twentieth century. Did leisure time rise significantly in response? To answer this question, I gather detailed data on the main uses of time by major segments of the population during the twentieth century. Although there have been numerous studies of time use and hours of work conducted during the early twentieth century, most of them were focused on a particular segment of the population. Thus, the main challenge of my research was to understand the particular context of each of the earlier studies and then to combine the pieces into a mosaic that would reveal patterns in time use for the general population.

In “Time Spent in Home Production in the Twentieth Century United States: New Estimates from Old Data,” I compile information from virtually every time-use study conducted from 1912 to the present in order to estimate trends in time spent on “home production”—that is, unpaid household tasks, such as cooking, cleaning, laundry, and taking care of children.<sup>2</sup> Almost all of the studies use detailed time diaries. While most sample only a few hundred people, together they cover thousands of individuals across the United States. The most detailed data are for farmwives and housewives, but some of the studies also surveyed employed women, men, and children. Others compared time use across racial groups. Although the individual-level data no longer exist,

some of the early studies reported very detailed tabulations by characteristics, which I was able to use in cell-based regressions. I then used these estimates to make the averages more nationally representative and linked them to the available micro data from 1965 on.

I find that time spent in home production by housewives fell by only a few hours between 1900 and 1965, confirming earlier results by sociologists.<sup>3</sup> For all prime-age women, time spent in home production fell by only six hours per week from 1900 to 1965, but by an additional twelve hours between 1965 and 2005, with most of that decrease occurring between 1965 and 1975. These results are surprising because the main diffusion of appliances occurred before 1965, not after. Moreover, much of the decrease in time spent by women from 1900 to 2005 was countered by an increase in time spent by men.

Including all age groups, I find that average time spent in home production actually rose slightly over the century. The absence of a decline in the population overall was in part due to the decrease in the share of children (who do little home production), the increase in the share of the retired elderly (who do more home production than the employed), and the loss of economies of scale as households got smaller.

Interestingly, time spent in home production by prime-age individuals did not decrease after the mid-1970s, although the composition of tasks changed significantly. In particular, as Mark Aguiar and Erik Hurst demon-

strate, time spent on such activities as cooking and laundry decreased steadily, while time spent on childcare increased.<sup>4</sup> Garey Ramey and I document and assess possible explanations for the dramatic rise in childcare time in the United States beginning in the 1990s.<sup>5</sup> We find that the largest increases in childcare time were among college-educated parents, although less educated parents also showed an increase. We test numerous possible explanations, such as safety concerns, income effects, and sample selection, but find that all are inconsistent with the data. We then offer a new theory linking at least part of the increase in childcare time to “cohort crowding” and the increase in competition to get into college. We argue that a significant portion of the increase in childcare time is parents trying to improve their children’s chances of getting into a “good” college by tutoring them and building up their after-school resumes. As one test of the theory, we turn to Canada, where there is no steep hierarchy of universities and where college admissions are less competitive. Using individual-level data from Canadian time-use studies, we show that time spent on childcare did not increase among college-educated parents in Canada over the past twenty years.

Neville Francis and I estimate time spent in a variety of activities in order to produce estimates of work and leisure by age and gender since 1900.<sup>6</sup> Specifically, we study home production, market work, formal schooling, commuting time, personal care time, and leisure time.

Our home production estimates are based on the time diary estimates from my earlier paper, augmented to correspond to the age groups in this paper. We find decreases in time spent in home production for those under the age of 25, little change for those ages 25 to 64, and some increase for those ages 65 and over.

We had to use alternative data sources for “hours of market work” because there was not sufficient information from the time diary studies on hours of market

work for various segments of the population. To measure aggregate time spent in market work from 1900 to 1958, we use the data compiled by Kendrick, which covers all sectors and adjusts for actual hours of work (rather than scheduled hours of work), and incorporates detailed estimates of the work of unpaid family members on farms.<sup>7</sup> We then use decennial census data on employment and school enrollment by age and gender to allocate the aggregate hours to each demographic group. For the later period, we use Current Population Survey data.

Our results paint a very different picture of trends in hours of market work from the ones typically discussed. For example, it is well documented that the normal workweek in manufacturing fell from about 60 hours per week in 1900 to about 40 hours in 2005. When we look at average weekly hours per capita for all prime age males, we estimate that they fell from 50 hours per week in 1900 to 41 hours in 1940 and 37 hours in 2005. Most previous references to dramatic decreases in the workweek either referred to the era before 1900 or focused on manufacturing. But in 1900, manufacturing accounted for only 20 percent of all workers — agriculture and the government sector had lower average workweeks, in part because of seasonality, and accounted for 40 percent of all employment. Thus, the average hours per capita for prime age males fell less than the standard workweek in manufacturing did.

For all individuals between the ages of 25 and 54, hours spent in market work changed by only a few hours between 1900 and 2005. This average masks the significant trends within gender, though: women in this age group increased their market hours by 18 hours per week whereas men decreased their market hours. Combined with the earlier estimates on home production, these time-use estimates indicate a decline in specialization by gender over time: in 1900, most men specialized in market work and most women specialized in home production; by 2005, there was

significant convergence in tasks across genders.

The groups with the greatest declines in market work over the twentieth century were those under age 25 and those over age 65. To understand how the time was reallocated for the young, it is important to estimate time spent in formal schooling. We estimate time spent in school using information on enrollment, the average days attended per enrollee, and hours spent in class and on homework per day attended. The latter estimates come from numerous time-use studies of school children beginning in the 1930s. Using these estimates, we determine that the 18-hour decline in market work among children ages 14 to 17 was channeled directly into time spent in formal education. The story was qualitatively similar for those ages 18 to 24.

After subtracting the various activities from the total amount of time available, we can study the residual, which we call “leisure.” We find that average weekly leisure time for those ages 25 to 54 was about the same in 2005 as it was in 1900. All other age groups enjoyed rises in leisure during the twentieth century, about five hours per week for those between the ages of 14 and 25 and fourteen hours per week for those over age 65.

We also estimate lifetime leisure for various cohorts. The fraction of one’s lifetime spent in leisure rose only modestly, from 24 percent for those born in 1890 to 25 percent for those born in 1950. Cumulative lifetime leisure rose by almost 50 percent, though, because of the increase in life expectancy. Mechanically, the extra years of life add to the lifetime endowment of time, so almost all uses of time rise significantly when viewed cumulatively over a lifetime.

On balance, my research indicates that the response of leisure time to productivity growth in the twentieth century United States was very weak. In a standard model, matching the mild increase in leisure time to the eight-fold increase in productivity requires that income and substitution effects approximately cancel each other out. However, standard mod-

els do not capture other possible trends that may have been occurring. For example, society may have used its increasing wealth to make work more pleasant, so that the demand for leisure did not rise as much as would be predicted by a simple model. Moreover, the invention of new products, and in particular medical technology that could extend life expectancies, may have increased the weight that individuals place on market goods and services.

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<sup>1</sup> J.M. Keynes, "Economic Possibilities for our Grandchildren," in *Essays in Persuasion*, London: The MacMillan

*Press Ltd.*, 1931, p. 358–74.

<sup>2</sup> V.A. Ramey, "Time Spent in Home Production in the 20th Century United States: New Estimates from Old Data," NBER Working Paper No. 13985, May 2008, and *Journal of Economic History*, Cambridge University Press, vol. 69 (March 2009), pp. 1–47.

<sup>3</sup> J. Vanek, *Keeping Busy: Time Spent in Housework, United States, 1920–1970*, Ph.D. Dissertation, University of Michigan, 1973.

<sup>4</sup> M. Aguiar and E. Hurst, "Measuring Trends in Leisure: The Allocation of Time Over Five Decades," NBER Working Paper No. 12082, March 2006,

and *Quarterly Journal of Economics* 122, 3 (August 2007): pp. 969–1006.

<sup>5</sup> "The Rug Rat Race," with G. Ramey, NBER Working Paper No. 15284, August 2009, and *Brookings Papers on Economic Activity*, forthcoming.

<sup>6</sup> "A Century of Work and Leisure," with N. Francis, NBER Working Paper No. 12264, May 2006, and *American Economic Journal: Macroeconomics*, American Economic Association, vol. 1 (July 2009), pp. 189–224.

<sup>7</sup> J.W. Kendrick, *Productivity Trends in the United States*, Princeton: NBER and Princeton University Press, 1961.

## A Decade of Change for the U.S. Auto Industry: The Internet, Promotions, and Rising Gasoline Prices

Florian Zettelmeyer\*

During the last decade the U.S. automotive industry has been affected by a series of major changes. First, automotive retailing, which had been firmly controlled by franchised automotive dealers, started to feel the effect of the Internet in the late 1990s. Although state franchise laws require all new cars to be sold by dealers, the Internet has become a major source of information about car characteristics and pricing.

Second, the 9/11 terrorist attacks changed the way that automotive firms compete in the United States. Eight days after 9/11, GM started an incentive promotion with the name "Keep America Rolling" which offered zero percent

financing on all GM vehicles for up to five years. While manufacturers had used financing or price incentives before, "Keep America Rolling" is thought to have started a substantial escalation of average incentive amounts.<sup>1</sup>

Third, the dramatic increase in gasoline prices from below \$1 in early 1999 to \$4 at their peak in 2008 made it much more expensive for consumers to operate an automobile. This has affected manufacturers differentially, depending on the fuel efficiency of the cars they sell. In a series of research papers, my co-authors and I have investigated the consequences for the industry of these changes.

### The Effect of the Internet on the Auto Retailing Industry

Even though consumers remain interested in physically inspecting a car, the Internet has become a very

important complement to the car-buying process. As early as the year 2000, 54 percent of all new vehicle buyers used the Internet in conjunction with buying a car. My work with co-authors Fiona Scott Morton and Jorge Silva Risso looks at whether and how the widespread use of the Internet by consumers has affected auto retailing.

We first investigate the effect of Internet car referral services (Autobytel.com, Autoweb.com, Carpoint.com, and the like) on dealer pricing of automobiles in the United States in 1999.<sup>2</sup> Combining transaction data with data from a leading online auto referral service, we compare online transaction prices to regular "street" prices. We find that Internet prices, controlling for the car purchased, on average were 1–2 percent lower than those paid by conventional consumers. In addition, we find that dealer average gross margin on an

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\*Zettelmeyer is a Research Associate in the NBER's Program on Industrial Organization and a Professor at Northwestern University. His Profile appears later in this issue.



online vehicle sale was lower than an equivalent offline sale. However, these findings do not imply that the Internet is shifting rents from car retailers to consumers. If online car buyers would also have negotiated low prices in the offline world, then the Internet merely provides an alternative channel for a consumer-dealer interaction.

To determine whether the Internet has a causal effect on car prices, we use instrumental variables to control for selection. We find that traditional buyers pay 2.2 percent more than Internet buyers.<sup>3</sup> This is consistent with consumers choosing to use the Internet because they know that they would pay more in the traditional channel, perhaps because they strongly dislike collecting information and bargaining in the traditional way.

This finding raises the question of the Internet's effect on groups of consumers who have traditionally been considered disadvantaged in the car buying process. In a follow-on paper, we analyze whether the Internet's dual role of reducing a dealer's ability to accurately assess a consumer's willingness to pay and increasing consumers' ease in finding information reduces discrimination in car buying by race and gender.<sup>4</sup> For offline car purchases, we find a minority race premium of 2.0 percent to 2.3 percent when we do not control for other demographics; 1.1 percent to 1.5 percent when we control for neighborhood characteristics; and 0.6 percent to 0.8 percent when we control for search costs. This demonstrates that pricing of new cars to offline consumers strongly depends on individual car buyers' characteristics. Our main finding is that the Internet eliminates most of the variation in new car prices that results from individual characteristics associated with race and ethnicity: online buyers who use the Internet referral service that we study pay the same prices as whites, even after controlling for their income, education, and other neighborhood characteristics. Because of the way race is measured in our data, it is implau-

sible that our results are due to selection. This suggests an additional aspect of the "digital divide": not only are disadvantaged minorities less likely to use a computer, but they are also the group that would most benefit from it.

While these papers are informative about the overall effect of Internet usage on new car prices, they leave some unanswered questions about the mechanism by which the Internet lowers prices for consumers. To answer this question we added much more detailed data on the way that consumers searched offline and online, and on their personal characteristics. This led to a paper in which we use direct measures of search behavior and consumer characteristics to investigate how the Internet affects negotiated prices in car retailing.<sup>5</sup> We match transaction data on 1,500 car purchases in California with the buyers' responses to a survey that asks detailed questions about their Internet usage, their attitudes towards information search and bargaining, and their demographics. We show that the Internet lowers prices for two distinct reasons: first, the Internet informs consumers — the most important piece of information that consumers glean on the Internet is the invoice price of dealers; second, the referral process of online buying services, a novel institution made possible by the Internet, also helps consumers obtain lower prices. Our results show that the combined information and referral price effects are -1.5 percent. This corresponds to 22 percent of dealers' average gross profit margin per vehicle. We also find that the benefits of gathering information differ by consumer type. Buyers who really dislike bargaining but who have collected information on the specific car they eventually purchase will pay 1.5 percent less than they otherwise would. In contrast, buyers who like the bargaining process do not benefit from such information.

In summary, this research stream shows that the Internet has had a substantial effect on the level and distribu-

tion of prices paid by consumers in the auto industry. This result is remarkable because dealer franchise laws prevent direct competition from either manufacturers or independent companies using the Internet to sell cars directly to consumers. Nonetheless, the ease with which the Internet allows consumers to access information, the partial obfuscation of individual characteristics when interactions are mediated through the Internet, and the referral mechanism, are enough to affect the distribution of surplus between consumers and firms.

### **The Effect of Pricing Transparency in the U.S. Automotive Market**

After 9/11, incentive promotions played an increasingly important role in the U.S. automotive market. These promotions also provide an opportunity for us to investigate how pricing transparency and information asymmetry affects the auto industry and its consumers.

Meghan Busse, Silva Rizzo, and I exploit a natural experiment to test the effect of private information on the division of surplus between consumers and automotive dealers.<sup>6</sup> Automobile manufacturers frequently use two types of promotions that give cash-back payments: rebates to customers, which are widely publicized to potential customers, and discounts to dealers, which are not publicized. While the payments nominally go entirely to one party or the other, the real division of the manufacturer-supplied surplus between dealer and customer depends on what price the two parties negotiate. These two types of promotions thus form a natural experiment of the effect of information asymmetry on bargaining outcomes, with the parties symmetrically informed in the customer rebate case and the dealer having an informational advantage in the dealer discount case. We show that customers receive approximately 80 percent of the customer rebate and

approximately 35 percent of the dealer discount. This is consistent with the theoretical prediction that when customers are at an information disadvantage, they are also disadvantaged in negotiations. In this setting, the information disadvantage is substantial: for a promotion of average size, consumers receive \$500 less of the surplus if they do not know that the promotion is available.

The preceding papers raise a more fundamental question: how well informed are automobile consumers about whether the price they negotiate with a dealer is a “good price,” what we refer to as their “price knowledge”? The evidence suggests that consumer price knowledge may not be high, given that information provided by the Internet and through the format of price promotions affect pricing. Most marketing studies on this topic have found that consumers have poor price knowledge, although the marketing studies generally have analyzed only low-priced goods (often in the context of supermarkets).<sup>7</sup> In contrast, buying a car is the second largest purchase of typical consumers and they spend many hours engaging in price search.<sup>8</sup>

To determine how much consumer price knowledge exists in the U.S. auto industry, Busse, Duncan Simester, and I analyze an unusual event.<sup>9</sup> During the summer of 2005, the Big Three U.S. automobile manufacturers offered a customer promotion: customers could buy new cars at the discounted price formerly offered only to employees. The initial months of the promotion produced record sales for each of the Big Three firms, suggesting that customers believed that the promotional prices offered were particularly attractive. We show that in reality, the rebates that had been available before the employee discount promotion were so large that many customers paid *higher* prices following the introduction of the promotions than they would have in the weeks just before. Nevertheless, unit sales increased for these cars, as well as for cars whose

prices decreased. We hypothesize that the complex nature of auto prices, the fact that prices are negotiated rather than posted, and the fact that buyers do not participate frequently in the market made it possible for auto manufacturers to manipulate customers’ beliefs about current versus future prices, even without changing prices themselves.

### The Effect of Gasoline Prices on New and Used Car Markets

The dramatic increase in gasoline prices from below \$1 in early 1999 to \$4 at their peak in 2008 made it much more expensive for consumers to operate an automobile. As concern about climate change has grown, economists have become increasingly interested in the question of how people respond to the cost of gasoline. Fully addressing this question is not easy, in part because there are many margins over which individuals—and firms—can respond, including the usage, production choice, customer choice, and technology of vehicles.

Busse, Christopher Knittel, and I address one aspect of this question: how gasoline prices affect the transaction shares and prices of new and used cars of different fuel efficiencies.<sup>10</sup> We combine data on local gasoline prices and data on model-specific fuel efficiency with transaction data from a 20 percent sample of U.S. new car dealers from 1999 to 2008. These dealers sell both new and used vehicles.

We find that a \$1 increase in gasoline price changes the transaction shares of the most and least fuel-efficient quartiles of *new* cars by +20 percent and -24 percent, respectively. In contrast, the same gasoline price increase changes the transaction shares of the most and least fuel-efficient quartiles of *used* cars by only +3 percent and -7 percent, respectively. We find that changes in gasoline prices also change the relative prices of cars in the most fuel-efficient and least fuel-efficient quartiles: for *new* cars the

relative price increase for fuel-efficient cars is \$363 for a \$1 increase in gas prices; for used cars it is \$2839.

There are three reasons why these results are interesting. First, the gasoline usage characteristics of the new cars added to the U.S. fleet every year affect the level of gasoline consumption (and greenhouse gas emissions) over subsequent years. Knowing how gasoline prices (and by extension gasoline taxes or carbon taxes) might affect what cars are sold is thus important for policy decisions. Specifically, our results suggest that consumer choices are quite sensitive to gasoline price changes. Second, our used car results reveal something about how consumers trade upfront capital costs against ongoing operating costs when they choose among cars of different fuel efficiencies. This can inform how policies intended to encourage energy conservation more generally should be crafted. The \$2839 increase in the difference between the most and the least fuel-efficient quartiles of cars reflects fuel expenditure savings associated with driving the average car in the most fuel-efficient quartile, rather than the average car in the least fuel-efficient quartile, for ten years assuming a 3 percent discount rate. This means that we find very little evidence that consumers are “myopic” in trading off upfront capital costs versus ongoing operating costs. Third, we find that the adjustment of equilibrium transaction shares and prices in response to changes in gasoline prices differs greatly between new and used markets. In the new car market, the adjustment is primarily in market shares, while in the used car market, the adjustment is primarily in prices. We show how this difference can be explained easily by differences in the supply of new and used cars.

In summary, the last decade has brought significant changes to the U.S. auto industry, culminating in the restructuring of much of that industry in the wake of the financial crisis. These changes have enabled us as researchers to learn about the effect

of new Internet institutions, information, price transparency, and usage cost on the U.S. auto market.

<sup>1</sup> See, for example the “Automotive Leasing Guide” [https://www.alg.com/pdf/ND09\\_RVR\\_US.pdf](https://www.alg.com/pdf/ND09_RVR_US.pdf)

<sup>2</sup> F. Scott Morton, F. Zettelmeyer, and J. Silva Riso “Internet Car Retailing”, NBER Working Paper No. 7961, October 2000, and *Journal of Industrial Economics*, Vol. 49 (4), 2001, pp.501–19.

<sup>3</sup> F. Zettelmeyer, F. Scott Morton, and J. Silva Riso, “Cowboys or Cowards: Why are Internet Car Prices Lower?” NBER Working Paper No. 8667, December 2001.

<sup>4</sup> F. Scott Morton, F. Zettelmeyer, and J. Silva Riso, “Consumer Information and Discrimination: Does the Internet Affect the Pricing of New Cars to Women and Minorities?” NBER

Working Paper No. 8668, December 2001, and *Quantitative Marketing And Economics*, Vol. 1 (1), 2003, pp. 65–92.

<sup>5</sup> F. Zettelmeyer, F. Scott Morton, and J. Silva Riso, “How the Internet Lowers Prices: Evidence from Matched Survey and Auto Transaction Data”, NBER Working Paper No. 11515, August 2005, and *Journal of Marketing Research*, Vol. 43 (2), 2006, pp. 168–81.

<sup>6</sup> M. Busse, J. Silva Riso, and F. Zettelmeyer, “1000 Cash Back: The Pass-Through of Auto Manufacturer Promotions”, NBER Working Paper No. 10887, November 2004, and *American Economic Review*, Vol 96 (4), 2006, pp. 1253–70.

<sup>7</sup> For a review of the literature, see E. T. Anderson and D. Simester, “Price Cues and Customer Price Knowledge,” in *Handbook of Pricing Research in*

*Marketing*, 2008, *Elgar Publishing Ltd.*

<sup>8</sup> See, for example, B. Ratchford, M. Lee, and D. Talukdar, “The Impact of the Internet on Information Search for Automobiles,” *Journal of Marketing Research*, 40 (May 2003), pp. 193–209.

<sup>9</sup> M. Busse, D. Simester, and F. Zettelmeyer, “The Best Price You’ll Ever Get’: The 2005 Employee Discount Pricing Promotions in the U.S. Automobile Industry”, NBER Working Paper No. 13140, May 2007, and *Marketing Science*, Vol. 29 (2), 2010, pp. 268–90.

<sup>10</sup> M. Busse, C. Knittel, and F. Zettelmeyer, “Pain at the Pump: The Differential Effect of Gasoline Prices on New and Used Automobile Markets”, NBER Working Paper No. 15590, December 2009.

## NBER Profile: Jens Ludwig

Research Associate Jens Ludwig co-directs the NBER’s Working Group on the Economics of Crime and is a member of the Program on Children and the Program on Health Economics. He is also the McCormick Foundation Professor of Social Service Administration, Law, and Public Policy at the University of Chicago.

After receiving his doctorate in economics from Duke University, Ludwig was on the public policy faculty at Georgetown University. His research focuses on urban problems related to crime, housing, health, and education.

Ludwig is a co-editor of the *Journal of Human Resources* and a member of the Institute of Medicine/National Academy of Sciences Board on Children, Youth and Families. In 2006 Ludwig received the David N. Kershaw prize for “distinguished contributions to public policy analysis and management by age 40.” He lives in the Hyde Park neighborhood of Chicago with his wife Liz, daughter Annika, and rescue mutt Trixi.



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## NBER Profile: *Brigitte Madrian*

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Brigitte Madrian has been an NBER Research Associate since 2001 in the Programs on Health Care, Aging, Labor Studies, and Public Economics. She is the Aetna Professor of Public Policy and Corporate Management at Harvard's Kennedy School of Government and Director of the Social Science Program at the Radcliffe Institute for Advanced Study.

Madrian received her Ph.D. in economics from MIT and a BA/MA in economics from Brigham Young University. Before joining the Kennedy School faculty in 2006, Madrian was at the University of Pennsylvania's Wharton School from 2003–6, the University of Chicago's Graduate School of Business from 1995–2003, and in Harvard University's Economics Department from 1993–5.

Her current research focuses on household saving and investment behavior. Her work in this area has influenced the design of employer-sponsored savings plans in the United States and pension reform legislation both here and abroad. She also has examined the impact of health insurance on the job choice and retirement decisions of employees and on the hiring decisions of firms.

Madrian is co-editor of the *Journal of Human Resources* and a recipient of the TIAA-CREF Paul A. Samuelson Award for Scholarly Research on Lifelong Financial Security in 2002.

Brigitte lives in Wellesley, MA with her husband David, her two daughters Erika (14) and Liesel (10), and their two adorable Coton de Tulear puppies, Mr. Darcy and Mr. Bingley.

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## NBER Profile: *Valerie Ramey*

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Valerie Ramey is a Research Associate in the NBER's Program on Economic Fluctuations and Growth and the Program on Monetary Economics. She is also a professor in the Economics Department at the University of California, San Diego (UCSD) and is Chair of the Institute for Applied Economics there.

Ramey received a B.A. in Economics and Spanish from the University of Arizona in 1981 and a Ph.D. from Stanford University in 1987. She joined the UCSD faculty in that year.

Her research has addressed such topics as the behavior of inventories, volatility and growth, the effects of government

spending, the source of business cycle fluctuations, wage inequality, and time use. She is past macroeconomics co-editor of the *American Economic Review*, and is a member of the Federal Economic Statistics Advisory Committee.

Ramey lives in San Diego with her husband Garey Ramey (also an economics professor at UCSD), and their two children: Sean, who is studying engineering at Stanford, and Michelle, who is a high school junior. When she is not studying other people's use of leisure time, she enjoys cooking ethnic cuisines, boogie boarding at La Jolla Shores, dancing, and attending the theatre.





Florian Zettelmeyer is a Research Associate in the NBER's Program in Industrial Organization. He also holds the J.L. Kellogg Chair in Marketing at Northwestern University's Kellogg School of Management.

Zettelmeyer received a Vordiplom in business engineering from the University of Karlsruhe (Germany), a M.Sc. in economics from the University of Warwick (UK), and a Ph.D. in marketing from MIT. Prior to his appointment at Kellogg,

he was an Associate Professor of Marketing and chair of the marketing group at the Haas School of Business, University of California at Berkeley.

His research deals with how information asymmetries between firms and consumers affect how well consumers do in markets. Recently he has focused on the automobile industry, investigating both informational and environmental issues associated with cars and car purchasing behavior.

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## Conferences

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### Twenty-first Annual EASE Conference

The NBER, the Australian National University, the China Center for Economic Research, the Chung-Hua Institution for Economic Research, the Hong Kong University of Science and Technology, the Korea Development Institute, the National University of Singapore, and the Tokyo Center for Economic Research jointly sponsored the NBER's 21st Annual East Asian Seminar on Economics. It took place on June 25 and 26, 2010 at the Reserve Bank of Australia. Takatoshi Ito, University of Tokyo and NBER, and Andrew K. Rose, University of California, Berkeley and NBER, organized the conference, which focused on "A Pacific Rim Perspective on the Financial Crisis." These papers were discussed:

- **Michael B. Devereux**, University of British Columbia and NBER; and **James Yetman**, Bank for International Settlements, "Financial Contagion and Vulnerability of Asian Financial Markets"
- **Warwick J. McKibbin** and **Andrew Stoeckel**, Australian National University, "Modelling the Impact of the Global Financial Crisis on World Trade"
- **Jonathan Eaton**, Pennsylvania State University and NBER; **Samuel S. Kortum**, **Brent Neiman**, and **John Romalis**, University of Chicago and NBER, "Trade and the Global Recession"
- **Bih Jane Liu**, Chung-Hua Institution for Economic Research, "Why World Exports Are so Susceptible to the Economic Crisis — The Prevailing 'Export Overshooting' Phenomenon Especially in Taiwan"
- **Jiandong Ju**, Tsinghua University, and **Shang-Jin Wei**, NBER and Columbia University, "When Are Trade Liberalizations and Capital Flows Substitutes or Complements?"
- **Ipppei Fujiwara**, **Nao Sudou**, and **Yuki Teranishi**, Bank of Japan; and **Tomoyuki Nakajima**, Kyoto University, "Global Liquidity Trap"

- **Yiping Huang, Nian Lin, Tao Kuyun, Wang Bijun, and Wang Xun**, CCER, “China’s Monetary Systems and Economic Performance during the Global Crises: From Great Depression to Great Crash”
- **Joshua Aizenman**, University of California, Santa Cruz and NBER; **Yothin Jinjark**, Nanyang Technological University; and **Donghyun Park**, Asian Development Bank, “International Reserves and Swap Lines: Substitutes or Complements”
- **Paul Bloxham, Christopher Kent, and Michael Robson**, Reserve Bank of Australia, “Asset Prices, Credit Growth and Monetary Policy: An Australian Case Study”
- **Hyun Song Shin**, Princeton University, and **Kwanho Shin**, Korea University, “Macroprudential Policy and Monetary Aggregates”
- **Shin-ichi Fukuda**, University of Tokyo, “Money Market Integration during the Global Financial Crisis: Evidence from the Interbank Markets in Tokyo and London”
- **Yongheng Deng, Jing Wu, and Bernard Yeung**, National University of Singapore; and **Randall Morck**, University of Alberta and NBER, “Monetary and Fiscal Stimuli, Ownership Structure and China’s Housing Market”

Summaries of these papers may be found at: <http://www.nber.org/confer/2010/EASE10/summary.html>

## NBER Conference in Beijing

The twelfth annual NBER-CCER Conference on China and the World Economy took place at the China Center for Economic Research (CCER) in Beijing on June 26–28, 2010. The conference program was jointly arranged by the National Bureau of Economic Research, the CCER at Beijing University, and Tsinghua University. After opening remarks by U.S. organizer Shang-Jin Wei of NBER and Columbia University, Yang Yao of CCER, and Chong-En Bai of Tsinghua University, the following topics were discussed:

### *Macroeconomics in China and the United States*

- **Feng Lu**, CCER, “Macroeconomic issues in China”
- **Simon Johnson**, NBER and MIT, “The Financial Oligarchy in the United States”

### *Exchange Rates and Economic imbalances*

- **Kenneth D. West**, NBER and University of Wisconsin, Madison, “Exchange rate Economics”
- **Yang Yao**, “Manufacturing-Finance Comparative Advantage and China’s Trade Surplus”
- **Binzheng Wu**, Tsinghua University, “Income Inequality, Status Seeking, and Consumption”
- **Chong-En Bai**, “Declining Share of Household Income in China”
- **Shang-Jin Wei**, “Global Imbalances and ‘Undervalued’ Currency”
- **Binkai Chen**, CUFE, “The Cursed Virtue — Infrastructural Investment and Household Consumption in China”

### *Entrepreneurship and Capital Allocation*

- **Erik Hurst**, NBER and University of Chicago, “Entrepreneurship”
- **Ping He**, Tsinghua University, “Capital Allocation and Operation Efficiency in China”

### *Banking and Consumer Finance*

- **Peter Tufano**, NBER and Harvard University, “Consumer Finance”
- **Yan Shen**, CCER, “Financial Sector Efficiency and Lending Behavior in China”

### *Consumer Credit and Regional Governments*

- **Jonathan D. Levin**, NBER and Stanford University, “Recent Research on Consumer Credit Markets”
- **Li-An Zhou**, GSM, “Incentives of Chinese Local Officials”

### *Health Economics*

- **Daniel Kessler**, NBER and Stanford University, “Health Economics”
- **Ling Li**, CCER, “Healthcare in China”
- **Amanda Kowalski**, NBER and Yale University, “Assessing the Impact of Health Care Mandates” (Presentation based on “The Impact of an Individual Health Insurance Mandate on Hospital and Preventive Care: Evidence from Massachusetts,” Jonathan T. Kolstad and Amanda E. Kowalski, NBER Working Paper No. 16012.)

### *Labor and Productivity*

- **Richard B. Freeman**, NBER and Harvard University, “Topics in Labor Economics”
- **Miaojie Yu**, CCER, “Processing Trade, Productivity, and Firm Scope”

Summaries of these papers may be found at: <http://www.nber.org/confer/2010/China10/summary.html>

## State and Local Pensions

An NBER Conference on State and Local Pensions, organized by Research Associate Jeffrey Brown of the University of Illinois and Robert Clark of North Carolina State University, took place on August 19 and 20, 2010. The following papers were discussed:

- **Henning Bohn**, University of California, Santa Barbara, “Should Public Retirement Plans be Fully Funded?”
- **Jean-Pierre Aubry**, **Alicia Munnell**, and **Laura Quinby**, Boston College, “Public Pension Funding Standards in Practice”
- **Sylvester Schieber**, Towers Watson, “Political Economy of Public Sector Retirement Plans”

- **Robert Novy-Marx**, University of Chicago and NBER, and **Joshua D. Rauh**, Northwestern University and NBER, “Policy Options for State Pensions Systems and Their Impact on Plan Liabilities”
- **George Pennacchi** and **Mahdi Rastad**, University of Illinois, “Portfolio Allocation for Public Pension Funds”
- **Eduard Ponds**, Netspar, and **Clara Severinson** and **Juan Yermo**, OECD, “Funding in Public Sector Pension Plans — International Evidence”
- **Leora Friedberg**, University of Virginia, “Labor Market Aspects of State and Local Retirement Plans: A Review of Evidence and a Blueprint for Future Research”
- **Brigitte C. Madrian**, Harvard University and NBER, “Defined Contribution Plans in the Public Sector: Lessons from Behavioral Economics”
- **Robert L. Clark** and **Melinda S. Morrill**, North Carolina State University, “Retiree Health Plans In the Public Sector”

Summaries of these papers may be found at: <http://www.nber.org/~confer/2010/SLPf10/summary.html>

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## NBER News

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### John Kendrick Dead at Age 92

John Kendrick, a long-time member of the senior research staff at the NBER, passed away on November 17, 2009, at the age of 92. In addition to his NBER role, he was a member of the economics faculty at George Washington University — where he had earned his Ph.D. — for many years.

He also served as Chief Economist of the U.S. Department of Commerce in the mid-1970s.

Kendrick made pioneering contributions to productivity analysis, national income accounting, and the estimation of capital stocks. He was one of the first to employ the concept

that today is known as total factor productivity. His 1961 NBER volume on *Productivity Trends in the United States*, with Maude Pech, remains a classical contribution to the long-term analysis of productivity trends.

### F. Thomas Juster, 1926–2010

F. Thomas Juster, who served as Vice President of the NBER from 1969 to 1972, died on July 21, 2010 at age 83. Born in Hollis, Long Island, New York, he received his Ph.D. from Columbia

University in 1956 and was a member of the NBER’s research staff from 1959 until 1973. In 1973 Juster joined the faculty of the University of Michigan, where he served as director of the

Institute for Social Research and was the founding director of the Health & Retirement Study. Juster was an active and effective advocate for the importance of social science research.

### Arnold Zellner

Arnold Zellner, who was elected to the NBER’s Board of Directors in 1980 and became a Director Emeritus in 2004, passed away on August 11, 2010. Zellner received his Ph.D. from

the University of California and taught at the University of Washington and at the University of Wisconsin before joining the faculty of the University of Chicago’s Graduate School of Business

in 1966. Zellner founded the NBER-NSF Seminar on Bayesian Inference in Econometrics and Statistics, and directed this seminar for more than twenty years.



## Thirty-first NBER Summer Institute Held in 2010

In the summer of 2010, the NBER held its thirty-first annual Summer Institute. Over 2000 economists from more than 300 different colleges, universities, and other economic research organizations throughout the world attended.

There were 47 distinct meetings, representing all of the 19 NBER re-

search programs and many of the working groups, and more than 400 separate research presentations. The Summer Institute included a set of Econometric Methodology Lectures on financial econometrics, as well as the second annual Martin Feldstein Lecture, delivered by Dr. Roger Ferguson, President and CEO of TIAA-CREF and former

Vice-Chairman of the Federal Reserve Board of Governors. A complete agenda and many of the papers presented at the various sessions are available on the NBER's web site at <http://www.nber.org/confer/2010/SI2010/SI2010.html>.

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## Program and Working Group Meetings

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### Japan Project Meets

The NBER together with the Center on the Japanese Economy and Business, The Center for Advanced Research in Finance, and the Australia-Japan Research Centre held a project meeting on the Japanese economy in Tokyo on June 25 and 26, 2010. The organizers were: Jennifer Corbett, Australia-Japan Research Centre; Charles Horioka, NBER and Osaka University; Anil K Kashyap, NBER and the Graduate School of Business, University of Chicago; and David Weinstein, NBER and Columbia University. The following papers were discussed:

- **Mary Amity**, Federal Reserve Bank of New York, and **David Weinstein**, “Exports and Financial Shocks”
- **Kazuo Ogawa**, Osaka University; **Elmer Sterken**, University of Groningen; and **Ichiro Tokutsu**, Kobe University, “Financial Distress and Industry Structure: An Inter-Industry Approach to the ‘Lost Decade’ in Japan”
- **Jennifer Corbett** and **Kazuki Onji**, Australian National University, and **David Vera**, Kent State University, “Capital Injection, Restructuring Targets, and Personnel Management: The Case of Japanese Regional Banks”
- **Yasushi Hamao** and **Pedro Matos**, University of Southern California, and **Kenji Kutsuna**, Kobe University, “Foreign Investor Activism in Japan: The First Ten Years”
- **Chad Steinberg**, International Monetary Fund, “Shakedown: Economic Geography Meets the Kobe Earthquake”
- **Takayuki Mizuno**, **Makoto Nirei**, and **Tsutomu Watanabe**, Hitotsubashi University, “Closely Competing Firms and Price Adjustment: Evidence from an Online Marketplace”
- **Yuki Hashimoto**, University of Tokyo, and **Ayako Kondo**, Osaka University, “Long-Term Effects of Labor Market Conditions on Family Formation for Japanese Youths”
- **Ayako Suzuki**, Waseda University, “An Empirical Analysis of Entrant and Incumbent Bidding in Electric Power Procurement Auctions”

Summaries of these papers may be found at: <http://www.nber.org/confer/2010/JPMs10/summary.html>

## Economic Fluctuations and Growth Research Meeting

The NBER's Program on Economic Fluctuations and Growth met in Cambridge on July 17. NBER Research Associates Erik Hurst, University of Chicago, and Matthew D. Shapiro, University of Michigan, organized the meeting. These papers were discussed:

- **Christopher J. Nekarda**, Federal Reserve Board, and **Valerie A. Ramey**, University of California, San Diego and NBER, "The Cyclical Behavior of the Price-Cost Markup"
- **Olivier Coibion**, College of William and Mary; and **Yuriy Gorodnichenko** and **Johannes F. Wieland**, University of California, Berkeley and NBER; "The Optimal Inflation Rate in New Keynesian Models" (NBER Working Paper No. 16093)
- **Jeremy C. Stein**, Harvard University and NBER, "Monetary Policy as Financial-Stability Regulation"
- **Raj Chetty**, Harvard University and NBER, "Bounds on Elasticities with Optimization Frictions: A Synthesis of Micro and Macro Evidence on Labor Supply"
- **Jonathan Eaton**, Pennsylvania State University and NBER, and **Samuel S. Kortum**, **Brent Neiman**, and **John Romalis**, University of Chicago and NBER, "Trade and the Global Recession"
- **Charles I. Jones** and **Peter J. Klenow**, Stanford University and NBER, "Beyond GDP? Welfare across Countries and Time"

Summaries of these papers may be found at: <http://www.nber.org/confer/2010/EFGs10/summary.html>

## The Economics of Household Saving

NBER Research Associate Erik Hurst of the University of Chicago and NBER President James Poterba of MIT, who co-direct an NBER project on "The Economics of Household Saving", organized a meeting of that project on July 24, 2010. The following papers were discussed:

- **Dean Karlan**, Yale University and NBER; **Margaret McConnell**, Harvard School of Public Health; **Sendhil Mullainathan**, Harvard University and NBER; and **Jonathan Zinman**, Dartmouth College, "Getting to the Top of Mind: How Reminders Increase Saving"
- **Mark A. Aguiar** and **Mark Bils**, University of Rochester and NBER, "Has Consumption-Inequality Mirrored Income Inequality?"
- **Garry Barrett**, University of Sydney; **Thomas Crossley**, Cambridge University, and **Kevin Milligan**, University of British Columbia and NBER, "Micro and Macro Based Saving Rates: What Explains the Differences?"
- **John Sabelhaus**, University of Maryland, and **Jae Song**, Social Security Administration, "The Great Moderation in Micro Labor Earnings"
- **Robert Townsend**, MIT and NBER, "Saving and Risk in Developing Countries: Theory and Evidence"

The authors of each of these papers have prepared short research summaries that describe their findings and the broader implications of their work. These summaries may be found at: [http://www.nber.org/confer\\_papers/summarize?conf\\_id=SIOSAV](http://www.nber.org/confer_papers/summarize?conf_id=SIOSAV)

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## Bureau Books

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<http://www.press.uchicago.edu/Misc/Chicago/infopage.html>

### The Economics of Crime: Lessons For and From Latin America

*The Economics of Crime: Lessons for and from Latin America*, edited by Rafael Di Tella, Sebastian Edwards, and Ernesto Schargrotsky, is available from the University of Chicago Press for \$110.00.

Crime rates in Latin America are among the highest in the world, and in several countries they have steadily risen over the past two decades. Despite this situation, there has been little systematic study of crime in the region or of the effectiveness of policies designed to tackle it. *The Economics of Crime*

addresses a variety of topics, including the impact of mandatory arrest laws, education in prisons, and the relationship between poverty and crime. It also presents research from outside Latin America, illustrating the broad range of approaches that have been fruitful in studying crime in developed nations. *The Economics of Crime* should interest researchers, policymakers, and students of both crime and Latin American economic policy.

Di Tella is a Research Associate in the NBER's Program on Political

Economy, and the Joseph C. Wilson Professor of Business Administration at Harvard Business School. Edwards is a Research Associate in the NBER's Program on International Trade and Investment and the Henry Ford II Professor of International Economics at the Anderson Graduate School of Management, University of California, Los Angeles. Schargrotsky is a professor and dean of the business school at Universidad Torcuato Di Tella.

### Targeting Investments in Children: Fighting Poverty When Resources Are Limited

*Targeting Investments in Children: Fighting Poverty When Resources Are Limited*, edited by Phillip B. Levine and David J. Zimmerman, is available from the University of Chicago Press for \$99.00.

About 17 percent of American children under the age of eighteen live at a level that meets the government's definition of poverty, and the proportion is even greater within minority groups. Childhood poverty can have lifelong

effects, resulting in poor educational, labor market, and physical and mental health outcomes for adults. Numerous programs are designed to alleviate or even eliminate poverty; as they compete for scarce resources, it is important to analyze their impact. The papers in this NBER Conference Report evaluate these programs using a common metric: their impact on earnings in adulthood. The volume's contributors explore a variety of issues, such as the effect of

interventions targeted at children of different ages, and they study a range of programs, including child care, after-school care, and drug prevention.

Levine is an NBER Research Associate in the Programs on Labor Studies and Children and the Class of 1919 Professor of Economics at Wellesley College. Zimmerman is a Research Associate in the NBER's Program on Education and a Professor of Economics at Williams College.

## The Economic Consequences of Demographic Change in East Asia

*The Economic Consequences of Demographic Change in East Asia*, Volume 19 in the NBER's series on the East Asia Seminar on Economics, is available from the University of Chicago Press for \$105.00. The volume's editors, who also co-chaired the conference, are NBER Research Associates Takatoshi Ito, University of Tokyo, and Andrew K. Rose, University of California, Berkeley.

Almost all industrialized countries have experienced dramatic decreases in fertility and mortality rates in recent

years, leading to aging societies and economies that suffer from a declining working population along with fiscal deficits linked to increased government spending. East Asia exemplifies these trends, and this volume offers an in-depth look at how long-term demographic transitions have taken shape there and how they have affected the economy in the region.

This seminar assembled a group of experts to explore such topics as comparative demographic change, population aging, the rising cost of healthcare,

and specific policy concerns in individual countries. The volume provides an overview of economic growth in East Asia as well as more specific studies on Japan, Korea, China, and Hong Kong. Offering important insights into the causes and consequences of this transition, the book will benefit students, researchers, and policymakers focused on East Asia, as well as anyone concerned with similar trends elsewhere in the world.

The following volume may be ordered directly from the University of Chicago Press Journals Division.

To order by telephone, call Monday through Friday, 8 am to 5 pm Central Time, (773) 753-3347; or toll-free in the U.S. and Canada, (877) 705-1878. To order by mail, the address is: University of Chicago Distribution Center, 11030 South Langley Avenue, Chicago, IL 60628, (773)702-7000

## Tax Policy and the Economy, Volume 24

*Tax Policy and the Economy*, Volume 24, edited by Jeffrey R. Brown, is now available from the University of Chicago Press Journals Division for \$60.00 (clothbound) or \$20.00 in paperback. This annual series of volumes presents current academic research findings on taxation and government spending.

Volume 24 includes studies of the relative efficacy of tax cuts versus spending increases as a form of economic stimulus; a targeted analysis of the Low Income Housing Tax Credit; two papers that examine different aspects of policies designed to provide fiscal stimulus; and an examination of the effects

of recent reforms in the Earned Income Tax Credit.

Brown is a Research Associate in the NBER's Programs on Public Economics and Aging and a Professor in the Finance Department at the University of Illinois at Urbana-Champaign.

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