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Amy Finkelstein: 2012 John Bates Clark Medalist

Jonathan Levin and James Poterba

Amy Finkelstein is the 2012 recipient of the John Bates Clark Medal from the American Economic Association. A notable feature of Amy's research program is the dedication with which she has pursued her core interests in insurance markets and health care. She has addressed, with new insights at each turn, central issues such as whether asymmetric information leads to inefficiencies in insurance markets, how large social insurance programs affect healthcare markets, and the determinants of innovation incentives in health care.

Amy's work is primarily empirical, but it is usually motivated by a deep connection to economic theory. She has designed empirical tests that shed light on competing theories and uncovered data patterns that provide the starting point for theoretical developments. By blending theory, problem-appropriate empirical methods, and high-quality administrative data, Amy has been able to make progress on long-standing questions that have defied easy resolution and to advance substantially our understanding of the economics of insurance markets and the markets for healthcare services more generally.

Amy was born and grew up in New York City. Her parents, Alan and Joan Finkelstein, are both biologists with Ph.D.s from Rockefeller University. Amy's mother left Poland and immigrated to the United States with her parents in 1940 at the age of three. Amy's maternal grandmother received a Ph.D. in comparative literature from the University of Warsaw in 1928, which makes three generations of doctorate-holding women in Amy's family.

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Amy began her stellar academic career at the Brearley School in New York City. Perhaps anticipating a future of entertaining lectures and seminar presentations, she earned pocket money as a high school student by working as a juggler and clown at birthday parties. Later, as an undergraduate at Harvard College, Amy majored in government. She also took a number of economics classes, however, and courses by Larry Katz and Alberto Alesina particularly attracted her to the field. When Amy received a Marshall Scholarship for postgraduate study in the United Kingdom, she enrolled in Oxford's two-year M.Phil. program in Economics. She received her degree in 1997. She then returned to the United States and spent a year in Washington, D.C., working at the Council on Economic Advisors. This experience proved formative, as Amy became interested in insurance markets. She also became convinced of the value of economics after seeing how the staff members at the Council were able to articulate clear frameworks for analyzing policy decisions.

Amy started graduate school at the Massachusetts Institute of Technology in the fall of 1998. She completed her dissertation in three years, working under the guidance of James Poterba, Jonathan Gruber, and Jerry Hausman. During her time as a graduate student, she overlapped with the last five winners of the Clark Medal: Emmanuel Saez, Esther Dufo, and Jonathan Levin were fellow Ph.D. students, while Daron Acemoglu and Susan Athey were junior faculty members.

A particularly notable event in Amy's graduate school career occurred toward the end of her second year, in the spring of 2000, when she met Harvard graduate student Ben Olken at a seminar given by Steve Levitt. After a spirited debate about Levitt's conclusions—the seminar was on Levitt's well-known work linking the legalization of abortion in the early 1970s to falling crime rates two decades later—Amy proposed that they continue their discussion over dinner that Friday. Ben counteroffered with the less-romantic suggestion of Thursday lunch, but, happily, he recovered from this early courtship mistake. Following in family tradition—her parents also met while in graduate school—Amy married Ben in 2005.

After receiving her Ph.D. from MIT in 2001, Amy spent a year as a postdoctoral fellow at the National Bureau of Economic Research (NBER) in Cambridge, with the support of the National Institutes of Health. She then was elected to the Harvard Society of Fellows, where she spent three years as a Junior Fellow. During this time, she wrote several influential papers on adverse selection in insurance markets and on innovation, and quickly established herself as rising star in applied economics. Amy returned to MIT as a faculty member in 2005, and was promoted to tenure two years later. Her husband, Ben, who was also a member of the Harvard Society of Fellows, joined the MIT economics faculty in 2008. Amy is currently the Ford Professor of Economics at MIT, and she is also the codirector, along with Raj Chetty of Harvard, of the NBER's Public Economics Program. In these roles, Amy has distinguished herself not just for her research but for her advising and professional leadership. Her colleagues and coauthors note that Amy stands out for her abundant energy, her enviable organizational skills, and her upbeat and warm sense of humor. Her students at MIT have repeatedly recognized her for her commitment to teaching and advising.



Amy Finkelstein

In the balance of this essay, we describe a number of Amy's key research contributions, with particular emphasis on those that were identified by the Honors and Awards Committee of the American Economic Association in her Clark Medal citation, as well as her broader contributions to the field of economics. Table 1 provides numerical references to Amy's papers cited in this essay.

Asymmetric Information in Insurance Markets

One recurring theme in Amy's research is how asymmetric information in insurance markets can affect the behavior of insurance buyers, insurance companies, and market equilibrium. Her analyses of long-term care insurance, annuities, and health insurance have helped to establish the empirical importance of asymmetric information in insurance markets, and also have explored the interaction between public policies and private market outcomes.

Simple theoretical models predict that the losses of those with greater insurance coverage should be greater than those with less coverage or no coverage at all. This outcome can arise either from selection, if individuals who are at high risk purchase more insurance, or from moral hazard, if individuals who purchase more insurance take fewer precautions against loss. Perhaps surprisingly, however, empirical studies of insurance markets have not always shown a positive correlation between insurance coverage and subsequent loss. Indeed, early studies of auto and

Table 1

Selected Papers by Amy Finkelstein

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1. "The Effect of Tax Subsidies to Employer-Provided Supplementary Health Insurance: Evidence from Canada." 2002. *Journal of Public Economics* 84(3): 305–340.
 2. "Selection Effects in the Market for Individual Annuities: New Evidence from the United Kingdom," (with James Poterba). 2002. *Economic Journal* 112(476): 28–50.
 3. "Minimum Standards, Insurance Regulation and Adverse Selection: Evidence from the Medigap Market." 2004. *Journal of Public Economics* 88(12): 2515–47.
 4. "Static and Dynamic Effects of Health Policy: Evidence from the Vaccine Industry." 2004. *Quarterly Journal of Economics* 119(2): 527–64.
 5. "Adverse Selection in Insurance Markets: Policyholder Evidence from the U.K. Annuity Market," (with James Poterba). 2004. *Journal of Political Economy* 112(1): 183–208.
 6. "The Interaction of Partial Public Insurance Programs and Residual Private Insurance Markets: Evidence from the U.S. Medicare Program." 2004. *Journal of Health Economics* 23(1): 1–24.
 7. "Multiple Dimensions of Private Information: Evidence from the Long-Term Care Insurance Market," (with Kathleen McGarry). 2006. *American Economic Review* 96(4): 938–58.
 8. "Why is the Market for Long-Term Care Insurance So Small?" (with Jeffrey R. Brown). 2007. *Journal of Public Economics* 91(10): 1967–91.
 9. "The Aggregate Effects of Health Insurance: Evidence from the Introduction of Medicare." 2007. *Quarterly Journal of Economics* 122(3): 1–37.
 10. "Input and Technology Choices in Regulated Industries: Evidence from the Health Care Sector," (with Daron Acemoglu). 2008. *Journal of Political Economy* 116(5): 837–80.
 11. "The Interaction of Public and Private Insurance: Medicaid and the Long-Term Care Insurance Market," (with Jeffrey R. Brown). 2008. *American Economic Review* 98(3): 1083–1102.
 12. "What Did Medicare Do? The Initial Impact of Medicare on Mortality and Out of Pocket Medical Spending," (with Robin McKnight). 2008. *Journal of Public Economics* 92(7): 1644–69.
 13. "EZ-Tax: Tax Salience and Tax Rates." 2009. *Quarterly Journal of Economics* 124(3): 969–1010.
 14. "Redistribution by Insurance Market Regulation: Analyzing a Ban on Gender-Based Retirement Annuities," (with James Poterba and Casey Rothschild). 2009. *Journal of Financial Economics* 91(1): 35–58.
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life insurance showed little relationship, raising the question of whether asymmetric information was an important factor in these markets, and more generally whether the classic models of insurance market equilibrium under asymmetric information were empirically relevant.

Amy tackled this issue in joint work with Kathleen McGarry [7] on the long-term care insurance market. Their analysis postulates that potential insurance buyers differ on two dimensions: their risk of experiencing an insured event, and their risk aversion. For a given risk aversion level, individuals with greater risk of loss—that is, with a higher probability of needing long-term care—should be more likely to purchase policies. At the same time, for a given probability of loss, individuals who are more risk averse should be more likely to purchase policies. When the two dimensions of heterogeneity are both present, however, whether or not policyholders will experience a higher rate of claims is ambiguous: it depends on the relative importance of, and the correlation between, risk aversion and risk type.

Amy and Kathleen explored this theory using data from the Asset and Health Dynamics Among the Oldest Old (AHEAD) survey. Their analysis showed that

Table 1—continued

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15. “The Private Market for Long-Term Care Insurance in the U.S: A Review of the Evidence,” (with Jeffrey R. Brown). 2009. *Journal of Risk and Insurance* 76(1): 5–29.
 16. “Estimating Welfare in Insurance Markets Using Variation in Prices,” (with Liran Einav and Mark Cullen). 2010. *Quarterly Journal of Economics* 123(3): 877–921.
 17. “Optimal Mandates and the Welfare Cost of Asymmetric Information: Evidence from the U.K. Annuity Market,” (with Liran Einav and Paul Schrimpf). 2010. *Econometrica* 78(3): 1031–92.
 18. “Insuring Long-Term Care in the United States,” (with Jeffrey R. Brown). 2011. *Journal of Economic Perspectives* 25(4): 119–42.
 19. “The Effects of Medicaid Coverage—Learning from the Oregon Experiment,” (with Katherine Baicker). 2011. *New England Journal of Medicine*, published July 20 at NEJM.org. doi: 10.1056/nejmp1108222.
 20. “Selection in Insurance Markets: Theory and Empirics in Pictures,” (with Liran Einav). 2011. *Journal of Economic Perspectives* 25(1): 115–38.
 21. “Beyond Testing: Empirical Models of Insurance Markets,” (with Liran Einav and Jonathan Levin). 2011. *Annual Review of Economics* 2: 311–36.
 22. “Selection on Moral Hazard in Health Insurance,” (with Liran Einav, Paul Schrimpf, Stephen Ryan, and Mark Cullen). *American Economic Review*, forthcoming.
 23. “The Oregon Health Insurance Experiment: Evidence from the First Year,” (with Sarah Taubman, Bill Wright, Mira Bernstein, Jonathan Gruber, Joseph P. Newhouse, Heidi Allen, Katherine Baicker, and the Oregon Health Study Group). 2012. *Quarterly Journal of Economics* 127(3): 1057–1106.
 24. “How General are Risk Preferences? Choices under Uncertainty in Different Domains,” (with Liran Einav, Iuliana Pascu, and Mark Cullen). *American Economic Review* 102(6): 2606–38.
 25. “Moral Hazard in Health Insurance: How Important is Forward Looking Behavior?” (with Aviva Aron-Dine, Liran Einav, and Mark Cullen). 2012. NBER Working Paper 17802.
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individuals’ subjective assessments of future nursing home use are predictive of subsequent utilization, even after controlling for observable attributes that the insurance company uses in setting the prices of its policies. Thus, individuals seem to have some private information about their potential long-term care needs. At the same time, individuals in their sample who buy insurance also are more likely to engage in health-promoting “preventive behaviors,” such as self-care and seat belt use, that may be correlated with risk aversion. Thus, individuals who are relatively cautious about their personal care (“belt and suspenders” types) are also more likely to purchase long-term care.

These findings provide a way to understand one of the main findings in Amy and Kathleen’s paper: in contrast to the basic theoretical prediction, the unconditional correlation between insurance coverage and loss is not statistically significantly different from zero. The presence of multiple dimensions of private information provides an explanation for this pattern because some types of private information, such as beliefs about the likelihood of nursing home use, are positively correlated with the demand for long-term care insurance and with the likelihood of receiving payment from the policy, while other types of private information, such as seat belt use, are positively correlated with the demand for insurance but negatively correlated with the likelihood of policy payouts. This paper, and particularly Amy and Kathleen’s observations about the relationship between risk-of-loss and insurance

purchases, has inspired a growing literature that focuses on broader forms of consumer heterogeneity in insurance markets and other contracting environments.

Annuities are another insurance market characterized by asymmetric information and adverse selection. Voluntary annuity markets in most countries are quite small, even though standard lifecycle theories suggest that many households might benefit from annuitizing at least some of their wealth, thereby increasing their insurance against living unexpectedly long. Adverse selection is one potential explanation for the limited size of the annuity market. If the only buyers of annuities are those who expect to live for many years, and if these expectations are correlated with actual life length, then an annuity policy that is actuarially fair for annuity buyers will be unattractive from the perspective of an individual with the population-average mortality rate. Amy has examined the annuity market in detail, generating both new insights about this specific market and about the welfare economics of insurance markets more generally.

Amy's first two studies of annuity markets, written with James Poterba, compared the degree of adverse selection in various segments of the U.K. annuity market. Until 2011, participants in many U.K. retirement plans were required to purchase annuities, and so that nation has one of the largest markets for annuity contracts. One study [2] contrasts the voluntary U.K. annuity market, in which individuals purchase annuities with wealth that has been accumulated outside retirement accounts, with the compulsory market, in which individuals who have accumulated resources in defined contribution pension plans are required to annuitize a fraction of these assets. The participants in such pension plans—the “compulsory annuitants”—are not a random sample of the population, but because the decision to work for a particular employer is typically made many years before retirement, these participants are less likely to be self-selected on the basis of mortality prospects than are those who purchase annuities in the voluntary market. The data on mortality rates support this proposition. The age-specific mortality rates for the population as a whole are greater than those for compulsory annuitants, which are in turn greater than those for voluntary annuitants. This finding is consistent with a greater degree of adverse selection in the voluntary than the compulsory annuity market.

The other Finkelstein and Poterba study [5] of annuities examines a rich data set on those who purchased annuity policies from a large U.K. insurance company over a two-decade span. The insurance company offered policies with different time profiles of payouts, including a level nominal payment policy as well as one with payouts that rose at the rate of inflation. A central contribution of this study is its focus on the choice of insurance policy attributes, rather than the purchase of the policy per se, as a manifestation of private information. The empirical findings suggest that individuals who chose back-loaded annuity policies where the payouts rose over time, such as inflation-indexed policies, on average lived longer than those who bought annuities that offered most of their benefits “up front.” In addition, those who purchased annuities that promised survivor benefits to the annuitant's heirs on average predeceased those who bought annuities without this clause. The findings provide further support for the role of private information in

the annuity market, and they suggest the possibility of designing richer tests than discrete comparisons between those who have and do not have insurance.

Amy's subsequent collaboration with Liran Einav and Paul Schrimpf [17] built on these insights about annuity purchasing by developing and estimating a structural model of insurance demand that allowed for what may be the first empirical estimates of the welfare consequences of asymmetric information. It also illustrates the complexity of policy design: for example, it shows that in certain conditions, a requirement that everyone participate in the insurance market may reduce welfare relative to the equilibrium of an imperfect private market with adverse selection. The structural modeling approach taken in the paper presents an interesting contrast to Amy's earlier work. It requires some strong assumptions about how individuals form expectations and make choices. But in turn, these assumptions make it possible to analyze a far wider range of actual and hypothetical policies than in the earlier studies that limited attention to the correlation between insurance choices and subsequent mortality (given existing policies).

One lesson from Amy's work on insurance market equilibrium is that the degree of adverse selection and the extent to which risks are pooled depends a great deal on whether insurers can condition prices on individual characteristics. In [14], with Poterba and Casey Rothschild, Amy investigates how restricting the information on which insurers can condition prices affects market outcomes. As an example of its more general findings, the paper rejects the simple notion that banning the use of gender in pricing annuities will inevitably redistribute from men—who on average die sooner and therefore receive higher annuity payouts in a gender-separating equilibrium—to women. Instead it suggests that insurers may find a range of ways to induce self-selection in the insurance market, for instance by offering back-loaded and front-loaded policies. If the policies are priced so that women find the back-loaded policies more attractive, and men the front-loaded, then the selection generated by these voluntary choices will reduce the degree of redistribution associated with a ban on gender-based pricing.

Adverse Selection and Moral Hazard in Health Insurance

Another component of Amy's work on insurance markets has been a fruitful collaboration with Einav and Mark Cullen, focusing primarily on problems of adverse selection and moral hazard in health insurance.

In [16], they showed how variation in insurance prices can be used to obtain estimates of insurance demand and coverage costs, which in turn allow for estimates of the consumer and producer surplus that might result from different pricing arrangements. Amy and her coauthors exploit a rich data set on the health insurance offerings that are available to employees at a large multidivision U.S. company. The "price" variation that underlies their empirical work arises from the fact that different employees within the company are charged different premiums for purchasing more comprehensive health insurance. Employees face a number

of choices with regard to copay rates, deductibles, and corresponding monthly premium costs.

The paper explores the empirical implications of the well-known principle that when an insurance company offers a suite of policies to a set of potential buyers, changes in the price of a given policy can affect the cost of delivering that policy through the induced effect on the set of consumers who purchase the policy. Like some other studies of employer-sponsored health plan choice, this project yields clear evidence of adverse selection, with the costliest individuals to cover also being the most eager to enroll in insurance plans with generous coverage. At the same time, however, the results suggest that the conditions for large welfare distortions are not met.

This result—that the presence of adverse selection does not itself imply large welfare losses—deserves elaboration. In a competitive insurance market, the potential for welfare loss arises because at a zero-profit equilibrium the market price for insurance is equal to the cost of covering the average enrollee. With adverse selection, this price is above the cost of covering the marginal enrollee, so that too few individuals purchase insurance. Practically speaking, welfare losses are likely to be large only when adverse selection results in a substantial price distortion and there is enough price-sensitivity on the part of consumers that the overly high price deters many from purchasing. Amy's paper was among the first to show empirically that the adverse selection could be substantial, yet the resulting welfare distortion relatively modest.

One especially nice feature of Amy's [16] paper with Einav and Cullen is that it explains welfare distortions under adverse selection using a demand and supply approach that connects to more standard partial equilibrium welfare analyses of taxes or subsidies. Amy's paper with Einav in this journal, [20], walks through this approach graphically, and makes for a useful and relatively light introduction to the recent empirical literature on adverse selection.

In a follow-up to this work using data from the same firm [22], the same coauthors, together with Schrimpf and Stephen Ryan, explore the relationship between adverse selection and moral hazard in health insurance. They begin with the observations that individuals differ in how they respond to more- and less-generous coverage and that these differences can generate a novel form of selection in insurance purchasing. For instance, moving someone into a high-deductible plan might lead to a considerable reduction in healthcare utilization. But if a company introduces a high-deductible plan as one of several options, the effect may be muted if the individuals who select it are precisely those whose healthcare utilization is relatively insensitive to out-of-pocket costs. This study exploits the rich data on insurance offerings and worker choices not only to document differences in individual price responsiveness, but also to estimate a structural model that incorporates both plan selection and healthcare utilization. The model suggests that "selection on moral hazard" indeed may mitigate some of the anticipated healthcare spending reductions from offering plans with high cost sharing, as price-responsive individuals tend to avoid these plans.

The degree to which individual healthcare utilization responds to changes in out-of-pocket costs is a much-debated empirical question, and it lies at the center of many proposals for insurance market reform. The question is difficult to answer for several reasons. First, an appropriate research design would approximate random assignment of individuals into different cost sharing arrangements—but such an arrangement is difficult to find in practice. Second, most insurance plans are highly nonlinear, often involving a deductible, a coinsurance rate, and an out-of-pocket maximum, so it often is not clear what “price” consumers face. In [25], Amy with Avia Aron-Dine, Einav, and Cullen develop a clever strategy for analyzing how consumers respond to nonlinear insurance coverage. They rely on the fact that coverage is not prorated for individuals hired at different points during a calendar year. A worker who is hired in November, and who participates in a plan with a \$500 annual per-worker deductible, is much less likely to have medical expenses in excess of the deductible than is a worker who is hired in January and who participates in the same plan for the whole calendar year. By comparing individuals hired at different points in time, some of whom will later exceed their deductible, it is possible to assess whether individuals respond to their expected out-of-pocket price given the level of total medical expenditures that they may experience before year-end. The paper finds that individual behavior is somewhat, but not fully, forward looking.

A related paper with Einav, Iuliana Pascu, and Cullen [24] returns to the subject of heterogeneity in insurance demand, and studies the extent to which individuals display similar degrees of risk aversion in various choice domains. It finds that product choice in one insurance market can be quite informative about product choice in other insurance markets but that there is less association between choices in insurance markets and other financial decisions, such as the stock-bond mix in a retirement plan.

A common feature of Amy’s health insurance papers as well as some of her work on annuities is that they involve analysis of large datasets consisting of administrative records that include information about insurance plan choices and subsequent insurance claims. This type of data has become an important resource for economists working on insurance markets. Amy’s survey paper with Einav and Levin [21] discusses some of the issues that arise in modeling and estimating empirical models of insurance demand and costs with this type of data. The paper explains that there are two general strategies for assessing pricing incentives or welfare losses under asymmetric information. One involves estimating how changes in price affect consumer purchases and insurer costs, while the other involves estimating parameters such as individual risk-aversion in a modeling framework that specifies exactly how and why consumers derive utility from insurance.

Government Provision and Regulation of Health Insurance

Issues concerning the economic effects of government provision of health insurance arise in many settings, including the Medicare and Medicaid programs,

and the ongoing national debate about health insurance coverage and market structure. Amy has made several important contributions in this area.

One of Amy's best-known papers, [9], examines how the introduction of Medicare affected the demand for health care in the United States. Many noneconomists expect that the answer to this question is well-known, since Medicare represented a dramatic change in health insurance provision. But because the change affected the whole nation, empirical researchers have found it difficult to construct a counterfactual that can be used to understand how the presence of Medicare has affected the healthcare marketplace.

Amy devised an insightful identification strategy to circumvent this difficulty by comparing the effect of the introduction of Medicare on hospital expenditures by elderly households in different regions of the United States. Prior to the introduction of Medicare, the incidence of hospitalization insurance policies varied widely across regions, so the fraction of elderly households who experienced changes in their ability to pay for hospital-based care when Medicare was introduced also varied across regions. Although the policy change was national, the effect of the policy relative to the prior situation varied substantially across regions.

Amy's study finds that in places where Medicare had an especially large effect in expanding insurance coverage, there was an especially large increase in health expenditures. A related study with Robin McKnight [12] finds that the introduction of Medicare affected the distribution of out-of-pocket medical expenditures for elderly households in the United States, although it had no discernible impact on mortality rates. This work on the introduction of Medicare is arguably the most convincing empirical analysis to date of how the most dramatic change in health insurance policy in U.S. history affected the consumption and financing of health care.

Another important and related project evaluates the effect of expanding Medicaid coverage. This project, which Amy has carried out in conjunction with a large team of collaborators including Sarah Taubman, Bill Wright, Mira Bernstein, Jonathan Gruber, Joseph Newhouse, Heidi Allen, Katherine Baicker, and the Oregon Health Study Group [19, 23], is remarkable on many dimensions. One is the ingenuity of the research approach. In 2008, Oregon expanded the coverage of its Medicaid program but did not have enough resources to allow universal access to this program. As a result, access to coverage was allocated by lottery, thereby creating a large-scale randomized experiment. After learning about this lottery system in the news media, Amy and her fellow researchers rushed to obtain funding and to field a large-scale mail survey collecting data on insurance status, healthcare utilization, financial strain, and health conditions among those who would potentially be eligible for Medicaid coverage. They subsequently combined this data with information from credit reports, hospital discharges, and mortality records. For a subset of the population, they have also conducted in-person interviews and physical health exams, and collected biometric data as well. In a remarkably short period of time, the research team has amassed an astonishing array of information about the individuals who were potentially affected by the Oregon health insurance lottery.

The early findings from the Oregon study suggest that the insurance expansion increased utilization of medical care and also that it reduced out-of-pocket health costs and led to higher self-reported physical and mental health status. Subsequent analysis using the biometric data are likely to shed light on whether increased care leads to measureable short-term clinical health benefits. Results from analyzing the Oregon experiment have just begun to appear. But because of the randomized access to health insurance that underlies this study, and the carefully planned and executed statistical analysis, the results are likely to be viewed as the “gold standard” for evaluating how health insurance availability affects household behavior and welfare.

In addition to her work on Medicare and Medicaid, Amy has tackled a number of other issues related to government’s role in health insurance markets. Her earliest work on health insurance, [1], explored the effect of the tax exclusion for health insurance premiums paid by employers. Existing studies of this topic have been hamstrung by the empirical difficulty of distinguishing differences in marginal tax rates across households from differences in other factors that may affect the demand for health insurance. Amy examined a provincial tax reform in Quebec in 1993 that substantially reduced the tax subsidy to employer-provided health insurance. By comparing the corresponding change in health insurance demand in Quebec with the change in health insurance demand in other provinces, she concluded that tax subsidies have significant effects on health insurance demand. In the case of Quebec, the estimates suggest that insurance coverage fell 20 percent as a result of the tax change. This finding implied a price elasticity of employer demand for insurance coverage with respect to the after-tax price of such coverage of about -0.5 .

A related paper [3] studies another government policy that affects insurance markets: minimum coverage requirements. There is a long-standing debate in insurance markets and other settings about whether government minimum quality standards raise welfare. On one side, minimum quality standards may raise product cost and lead some consumers to drop out of markets in which they would otherwise have purchased lower-quality and less-expensive goods. This effect tends to reduce welfare. However, by providing consumers who continue to purchase the product with a form of quality assurance, such regulations might raise welfare. Amy evaluates this trade-off in the case of the health insurance market for elderly Americans. In the early 1980s, the federal government encouraged states to require that all insurers offering policies designed to supplement the basic Medicare insurance package—so-called “Medigap policies”—had to provide a specified level of minimum coverage. Comparing insurance purchases by elderly households before and after the imposition of these minimum standards reveals a substantial decline in the overall rate of coverage, suggesting that the negative effect of minimum standards on quantity demanded operated for at least a significant share of Medicare beneficiaries.

Amy’s focus on the detailed provisions of insurance markets and on how they affect market participants and market equilibrium is also evident in [6], a study that explores how the provision of partial public insurance may affect insurance market outcomes. Amy explores this issue by considering how the availability of Medicare,

which is partial public insurance for healthcare outlays, affects the private market for insurance for residual, Medicare-uninsured, risks. She focuses on insurance for prescription drugs, which were not covered by Medicare during the time period of her study. Amy notes that prior to age 65, many individuals are covered by health insurance policies that provide both hospitalization coverage and prescription drug coverage. At age 65, however, when they become eligible for Medicare, they may lose their prescription drug coverage. While this study finds little change in the overall probability of individuals having prescription drug insurance before and after age 65, it does uncover a shift in the set of individuals who have this coverage. After age 65, the coverage rate among the least healthy members of the population rises, while that among healthier individuals remains stable or declines. In theoretical models of private market insurance, it is possible that the introduction of partial coverage by the government can upset a pooling equilibrium in which different risk types purchase the same insurance coverage, and lead to a separating equilibrium in which low-risk individuals will opt not to purchase coverage. The findings in Amy's study are consistent with the emergence of a separating equilibrium for the post-65 population with the highest risk group, those individuals in poor health, receiving full insurance while the better risks do not have prescription drug insurance.

Long-Term Care Insurance

Amy has devoted substantial research effort to understanding the market for long-term care insurance. She studied the role of multidimensional heterogeneity in this market in her joint work with McGarry; in a related sequence of papers with Jeffrey Brown, [8, 11, 15], she has studied other aspects of this insurance market. Some of her work with Brown, [18], appeared in this journal.

While aging individuals face substantial risk that they will require costly long-term care, relatively few purchase long-term care insurance. In [8], Brown and Finkelstein estimate the load factors on long-term care insurance policies. While the expected payouts on these policies are typically lower than their premiums, making them less than actuarially fair, the divergence from the benchmark of actuarial fairness is not substantially different from the divergence in a number of other insurance markets in which there is more active consumer interest.

A related study, [11], suggests that Medicaid, which covers the cost of long-term care for households that exhaust their assets, may play a key role in crowding out the private insurance market. For many households, Medicaid is a substitute for private long-term care insurance, and its presence reduces the willingness to pay for private insurance. In particular, private insurance policies must continue to pay even if someone becomes Medicaid-eligible, which makes the cost of private long-term care insurance high relative to the net-of-Medicaid benefits received by an insurance buyer.

The study undertakes a quantitative analysis to see whether the implicit tax that Medicaid imposes on private insurance benefits can explain why the market is so

small. The substantive importance of Medicaid depends on the distribution of wealth and income among elderly households because some households with high levels of financial wealth, who are very unlikely to draw down their assets completely, are also unlikely to be affected by the presence of Medicaid. For low-wealth households, in contrast, the implicit tax effects can be much more important. Using a carefully calibrated model along with household-level data on income and wealth, this study finds that a substantial fraction of elderly households face very high implicit taxes, which result in private long-term care insurance having relatively low value once Medicaid is taken into account. The results in these papers suggest a straightforward demand-side explanation for the limited interest in private long-term care insurance.

Innovation in Health Care

Explaining the rising cost of health care relative to other goods is one of the central questions in both health economics and public finance because health costs are a crucial component of government spending. One frequently mentioned hypothesis holds that technological change in the healthcare sector has produced increasingly expensive treatments for various diseases. To evaluate this possibility, and how public policy might affect the future course of innovation, it is important to understand the extent to which new product introductions in health care are “supply driven”—that is, determined by the current state of technical knowledge—or “demand driven,” and thus determined by the market returns from a new product. Amy has studied this issue in several contexts.

In [4], Amy explores how changes in federal health insurance rules with regard to vaccine coverage, and other changes that affected the demand for specific vaccines, affected the level of private research and development spending on new vaccines. Amy identifies three policy changes that increased the potential benefits to pharmaceutical firms producing vaccines, two of which are related to insurance policy reforms. One is the 1993 expansion of Medicare to cover the cost of flu vaccines. The second is the 1986 introduction of the federal Vaccine Injury Compensation Fund, which created a trust fund to compensate those injured by receiving a vaccination—and thus reduced the potential legal liability of firms producing such vaccines. The third reform she examines, which did not operate through insurance markets but is likely to have resulted in an outward shift in the demand for vaccinations, is the 1991 recommendation by the Centers for Disease Control that all infants should receive Hepatitis B vaccinations. In the years following each of these reforms, Amy finds an increase in the number of new clinical trials for vaccines that are directed at the specific diseases covered by each reform. These results offer a novel and interesting source of evidence for the link between government policies and the nature of innovation and technical change in the healthcare sector.

Another creative paper on innovation, joint with Daron Acemoglu [10], examines how a change in Medicare that increased the share of capital relative to labor costs for which hospitals could receive reimbursement from Medicare

affected hospitals' technology choices and input mix. The paper suggests that hospitals shifted away from labor inputs after this policy change. The skill mix of hospital employees also shifted, as various models of capital–skill complementarity would predict, and technology adoption increased, suggesting a high degree of substitution between labor and technology. This paper provides further evidence for the significance of government policies in affecting innovation and technology adoption in the health sector.

Final Remarks

Our discussion of Amy's research has highlighted Amy's contributions to the economics of insurance markets and health care and also her remarkable productivity. Amy has managed to carry out several large-scale research programs while supervising a steady flow of graduate students, coparenting two small children with her husband Ben, and still finding time to send multipage, single-spaced emails to colleagues whose papers she has read. Perhaps reflecting her early training as a juggler, Amy manages these multiple roles with good cheer and good humor.

We started this essay by noting the dedication with which Amy has pursued her primary research interests. Her research has occasionally ranged farther afield, for instance in her clever study [13] showing how the introduction of automated "EZ-Pass" systems to collect bridge and toll fees has led to more frequent fee increases. However, Amy generally has targeted her research toward a well-defined set of important and challenging questions: how insurance markets are affected by problems of asymmetric information; how large social insurance programs affect healthcare markets; and how different incentives affect the rate and direction of healthcare innovation. Amy has made progress on these classic issues both by connecting economic theory to empirical application and by finding rich new data sets. These include provincial data on health insurance utilization in Canada; administrative health claims data from large employers; heretofore unavailable data from British insurance companies; data from American Hospital Association archives that retained paper records that could be digitized; and, in her recent work on Medicaid, credit histories, hospital records, and biometric data from health exams. With careful and rigorous econometric analysis, Amy's work has enriched the scholarly analysis of insurance and healthcare markets, and has provided important insights for policymakers who are considering reforms to these markets.

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