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## Program Report

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## Program on Health Care

Jonathan Gruber\*

The NBER's Program on Health Care was founded in 1990 and led by its inaugural program director, Alan Garber, from 1990 until 2009. Under Alan's leadership the program grew rapidly; I have the privilege of succeeding him. The Program's researchers have expanded the boundaries of the field by asking exciting new questions, incorporating cutting edge empirical techniques, and finding new and innovative data sets to study. Interest in the work of this Program has increased enormously over the past three years, in particular as a result of the ongoing debate over the Affordable Care Act (ACA) which was passed in March 2010 and represents the most significant reform of our health care system since the introduction of Medicare and Medicaid in the mid-1960s.

While it is impossible to summarize the enormous amount of work that has been undertaken by Health Care Program researchers, this report provides an overview of research in several of the most active areas of the Program over the past five years.

### Insurance Plan Choices

One of the most exciting developments in the Health Care Program has been the mix of theoretical and empirical strategies brought to bear on understanding insurance plan choices by individuals. Much of this work has been led by Amy Finkelstein, Liran Einav, and their collaborators. In one paper (14414), the authors use new data from a large private employer to develop and implement a test of the importance of adverse selection in employer-provided health insurance coverage (whereby the sick choose the most generous health insurance plans), finding that such selection does not appear to cause large welfare losses. In two subsequent papers (15241, 16723), they develop general techniques for test-

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# NBER Reporter

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ing insurance market theories. And, in more recent work (16969, 17802), they extend their framework to consider additional questions. Is the selection of a health insurance plan driven by the individual's understanding of how much more care he or she will use when enrolled in more generous insurance? (Yes.) Do individuals consider the implications of their current utilization for future health insurance prices that they might face? (To a modest extent, but not fully.) Additional research by Benjamin Handel (17459) shows that individuals are highly inertial in their health plan choice, and that this may be a key reason for the low welfare costs of adverse selection practice.

One important feature of recent health care reforms is an increased reliance on consumer choice of a health care plan. A number of studies have focused on the new prescription drug plan, Medicare Part D, which when introduced in 2006 allowed elders a choice of a wide range of insurance options. Initial work on this program by Florian Heiss, Daniel McFadden, and Joachim Winter (13627) showed that elders were largely making appropriate choices about whether or not to sign up for the voluntary Part D program, but also suggested that elders might not be choosing the right plan for their drug needs. My research with Jason Abaluck (14759) uses data on actual plan choices by Part D enrollees to show that enrollees are overweighting premium costs relative to the out-of-pocket costs that they incur for drugs under their Part D plans. As a result, the typical senior could have saved about 30 percent by choosing a more appropriate Part D plan. Jeffrey Kling and others (17410) confirm this when they show that providing elders with information about which drug plans would best reduce their overall out-of-pocket costs significantly affects plan choice.

Several other studies show the important effects of search frictions and failures on insurance markets. NBER researchers James Rebitzer and Lowell Taylor and their coauthors (14455) show that the enormous search costs in the non-group health insurance market lead to significant price dispersion and welfare losses. Likewise, Nicole Maestas, Mathis Schroeder, and Dana Goldman (14679) find wide price dispersion in the market for a homogeneous good, Medigap insurance, which suggests that search fails to impose efficiency on the market. This issue is not confined to the United States:

Richard Frank and Karine Lamiraud (13817) find very broad dispersion in prices for similar insurance products sold on Swiss insurance exchanges.

Other studies have demonstrated the problems posed by imperfect risk adjustment in insurance markets. Kate Bundorf, Jonathan Levin, and Neale Mahoney (14153) show that a lack of risk rating of employee contributions in employer-sponsored insurance leads to significant welfare losses. However, they still estimate that welfare is higher under such circumstances than when there are no choices across insurance plans. This suggests that the welfare losses from choice could be mitigated by better risk adjustment mechanisms. Yet research by Mark Duggan, Illyana Kuziemko, and coauthors (16977) on attempts to risk-adjust for plan choice in the Medicare Advantage program (which offers private insurance alternatives to the government run Medicare program) suggests that these changes have actually *cost* the government money, because insurers have skewed their enrollments towards those groups that are relatively favored by the risk adjustment scheme. Taken together, these studies suggest caution in relying on unfettered choice to generate efficient outcomes in insurance markets.

## Health Production

A second major area of research for our program, as well as the NBER Health Economics Program, has been the production of health itself, which depends on a wide variety of factors both inside and outside the health care sector. Researchers have been incredibly innovative in searching for the factors that might matter for health production and in developing convincing empirical techniques for testing their importance.

Much of this work overlaps with the Health Economics Program led by Michael Grossman, and was reviewed by him several years ago in the Reporter. In particular, there is extensive work on one of the most important public health problems in the United States and around the world, obesity. This area was reviewed

recently by Christopher Ruhm (16149), while John Cawley and Chad Meyerhoefer (16467) estimate that the costs of treating obesity-related illness account for one-sixth of total U.S. health care spending. There is also extensive research on the determinants and health consequences of risky behaviors, a topic reviewed recently by Cawley and Ruhm (17081).

A large number of articles explore the broader determinants of health. Some discuss the importance of health care in determining mortality, including work by David Card, Carlos Dobkin, and Maestas (13668) who show that becoming eligible for Medicare at age 65 significantly reduces mortality for hospital emergency admissions. Other research by Douglas Almond and coauthors (14522) shows that more intensive treatment of newborns whose birth weight falls just below clinical cutoffs leads to reduced infant mortality. A series of articles by Cutler and coauthors (17148, 15678, 14333) shows how factors such as socioeconomic status influence health. Work by Ann Stevens et al. (17657) shows that the fact that mortality rises in economic boom times may be largely because of lower quality workers in medical facilities. And, a pair of studies by William Evans and Timothy Moore (15310, 15311) shows that short-term increases in income tend to increase mortality; for example, mortality decreases before paychecks arrive at the start of the month and increases directly thereafter.

A blossoming area of work in health production is exploring the determinants of health in developing countries, highlighting the important constraints that these poorer populations face for improving their health. For example, Neeraj Sood and coauthors (13649) find that when overall mortality rates are higher, families favor children who are more likely to survive over those who are less likely to live. Anne Case and Christina Paxson (15000) find that regions in Africa that are suffering from the most severe AIDS epidemics also provide the fewest services for newborns. And Seema Jayachandran (14011) shows that wildfires in Indonesia reduced air quality and

led to a substantial increase in infant mortality in that country.

## Health Care Labor Markets

In the health sector, the major source of costs continues to be labor and that is an area of particular interest for researchers in our Program. For example, a pair of studies explored the role of unionization of health care workers: Robert Town and coauthors (17733) compare nursing homes where unions barely win election to others where unions barely lose. They find that in the former case the resulting unionization leads to lower employment with no worse patient outcomes, suggesting a concurrent increase in productivity. Samuel Kleiner and I (15855) find that strikes among unionized nurses have negative implications for patient outcomes, with mortality rising among patients in New York hospitals during nurses' strikes.

Another important issue in this area is the allocation of medical providers across hospitals and patients. Meltzer and Jeanette Chung (16040) discuss the rise of "hospitalists": physicians who specialize in seeing patients only in the hospital setting. They develop and test a model of coordination of care across medical settings describing those situations in which hospitalists would be most advantageous. Joseph Doyle et al. (14174) show that the random allocation of patients across physicians has important implications for patient treatment: patients assigned to physicians who studied at a higher-ranked medical school are treated much more efficiently than those who see physicians from a lower-ranked institution. Guy David and coauthors (16418) find that patients treated by paramedics who are near the end of their shifts spend more time between the accident and the hospital. And Martin Gaynor and coauthors (16077) find that regulations designed to increase the number of nurses per patient in California hospitals have had their intended effect, but did not lead to any improvements in patient outcomes.

## The Economics of Prescription Drugs

Over the past decade, prescription drug costs have risen substantially as a share of total health care spending, and interest in this area has grown with the introduction in 2006 of the Medicare Part D Program. Many papers by Health Care Program researchers have explored interesting questions in the economics of prescription drug utilization, insurance coverage, and market design.

A number of studies in this area have focused on the optimal regulation of prescription drug safety. Tomas Philipson and coauthors (13561, w15603) have noted that drug safety is jointly promoted by regulation, through the Food and Drug Administration, and by the legal system, through drug safety lawsuits. They suggest that such an overlapping system leads to inefficiencies, and they show that a program designed to reduce drug safety lawsuits has led to lower prices for drugs without any increase in adverse drug outcomes. Ellen Meara and coauthors (17426) show that new warning labels that decreased the use of anti-depressants led to worse school performance, increased delinquency, and increased use of illicit substances among depressed teens. And Guy David, Sara Markowitz, and coauthors (14634, 17162) find that increased advertising for prescription drugs increases utilization but also increases the number of adverse outcomes reported to regulators, presumably because of less appropriate use as utilization expands.

Other research in this area has focused specifically on the role of prescription drug insurance coverage for the elderly, which was dramatically expanded under Part D. Darius Lakdawalla and Sood (13501) argue that drug patents are necessary for innovation but lead to underproduction by monopoly pricing drug companies. As a result, the prescription drug coverage provided by Part D can improve welfare by encouraging utilization without lowering prices and the returns to innovation. A number of studies have documented increases in

prescription drug utilization under Part D, but there remains considerable dispute between those that find modest effects (14326) and those that find much larger effects (13917, 16011). Duggan and Fiona Scott-Morton (16011) find that Part D led to dramatic declines in drug prices as a result of larger negotiated price discounts by drug insurers. Gary Engelhardt and I (16155) find that Part D coverage largely served to crowd out existing private insurance coverage for prescriptions among the elderly, with only modest associated reduction in actual out-of-pocket cost exposure.

## Controlling Health Care Costs

The most important long-run fiscal problem facing the United States is the rising cost of health care, which is the largest and single fastest growing element of both Federal and State government spending. But controlling health care costs is a daunting challenge, both because we are still not fully clear on the particular drivers of high and rising health care spending (especially in the United States relative to the rest of the world), and because efforts to control costs might significantly worsen population health. Researchers in the Health Care Program have provided a broad set of insights that can move us towards the goal of controlling costs without dramatically reducing health.

A central question in the cost control debate is how providers should be reimbursed. Phillip DeCicca and coauthors (16909) and Kathleen Mullen, Richard Frank, and Meredith Rosenthal (14886) investigate the particularly popular idea of “pay for performance” through which provider reimbursement is tied to meeting particular quality thresholds. Strikingly, neither study suggests that such incentives have meaningfully affected quality of care. At the same time, Vivian Wu and Yu-Chu Shen (16859) find that reductions in hospital reimbursement by Medicare in the late 1990s led to significant increases in patient mortality. And Doyle et al. (17936) find that patients brought by

ambulance to higher versus lower cost hospitals have significantly improved mortality outcomes.

Another central question for health care is how the market organization of medical providers influences both health care spending and health outcomes. For example, Gaynor, Rodrigo Moreno-Serra, and Carol Propper (16164) study the introduction of hospital competition in the United Kingdom. This was the result of allowing patient choice of hospitals. They find that in areas with greater hospital choice, the introduction of competition led to lower costs and to better patient outcomes. Christopher Afendulis and Daniel Kessler (17316) find that the introduction of high-powered payment incentives is more productive when providers are more highly vertically integrated.

There are comparable questions about the organization of insurance markets. Leemore Dafny (14572) finds that health insurance markets are not perfectly competitive, since she shows that the prices charged for health insurance depend on the purchasing firm’s profitability. On the other hand, Lakdawalla and Wesley Yin (15330) show that the concentration of insurer market power in the Part D prescription drug program, and the associated rise in bargaining leverage with drug manufacturers, leads to significantly lower drug prices to the Part D program. Indeed, in a follow-on paper (16251) they find that the higher market power accruing to private insurers through their Medicare Part D enrollment led to comparable declines in drug prices for those who are privately insured for prescription drugs.

Health Care researchers also have focused on the central issue of technological advances in health care. For example, Cutler (13478) studies the long-run impacts of a particular medical technology, cardiac revascularization, and finds that the procedure has reduced mortality in a cost effective way. On the other hand, Amitabh Chandra and Jonathan Skinner (16953) discuss the broad heterogeneity in the effectiveness of technologies and the inefficiencies associated with “grey



area” treatments with uncertain clinical value, and Skinner and Douglas Staiger (14865) show that unambiguously productive technologies diffuse at very different rates across hospitals. Research by Chandra, Skinner, and Anupam Jena (16990), and by Anriban Basu and Philipson (15633) takes a skeptical look at the potential for “comparative effectiveness research” to slow health care cost growth in the United States, although Basu (16900) argues that such research can have larger effects if it can be individualized to patient needs. An excellent summary of these issues is provided by Garber and Skinner (14257) who catalogue the factors that make U.S. health care particularly inefficient.

### Covering the Uninsured

Finally, the debate over the Affordable Care Act was influenced by, and in turn inspired, many studies about the various policies that might be followed to extend insurance coverage to the 50 million uninsured Americans. A number of studies in this area provided

framing of the broader issues around insurance coverage. I wrote an overview article (13758) which laid out many of the issues faced by policymakers as they try to expand insurance coverage, while Sherry Glied wrote several papers (13881, 13885, 14545) discussing particular policy issues around insurance coverage expansion, such as the source of financing and the role of affordability exemptions under individual mandates. Thomas Buchmueller and Alan Monheit (14839) discuss the central role of employer-sponsored insurance in the U.S. system and whether it should be retained as a feature of system revisions.

A major source of inspiration for the Affordable Care Act was a similar reform enacted in Massachusetts in 2006, and several studies have evaluated the effects of this earlier reform. Jonathan Kolstad and Amanda Kowalski (16012) find that the Massachusetts reform increased preventive care and reduced hospital utilization. Charles Courtemanche and Daniela Zapata (17893) estimate that expanded health insurance coverage in Massachusetts

improved a wide variety of measures of both physical and mental health. I provide an overview of the set of impacts of health reform in Massachusetts and their implications for projecting the effects of the ACA (17168).

Other studies have focused directly on developing evidence on the impact of insurance coverage on medical spending and health. An exciting study by Finkelstein et al. (17190) documents the initial findings from a randomized experiment in Oregon, where individuals were randomly pulled off a waiting list and enrolled in public insurance coverage. This study finds that receiving insurance coverage led to a significant increase in health care utilization, improved self-reported health (particularly mental health), lower measures of financial strain, and higher levels of self-reported well being. Michael Anderson, Dobkin, and Tal Gross (15823) show that young adults aging out of their parents health insurance coverage around age 19 see large reductions in use of both the hospital and the emergency room.



# International Prices and Exchange Rates

Gita Gopinath\*

Milton Friedman advocated flexible exchange rates on the premise that they would allow the relative prices of domestic and foreign goods to adjust in a world with nominal rigidities. The strength of his argument, and its implications for monetary and exchange rate policy, depend crucially on the specifics of nominal rigidity: How rigid are prices? Are prices fixed in the producer's currency or in the local currency? When prices adjust, how much do they respond to exchange rate shocks?

The validity of several of the benchmark models and the main hypothesis in international macroeconomics — such as the Mundell-Fleming models of the 1960s, Dornbusch's overshooting exchange rate hypothesis, and the more recent New Open Economy Macroeconomics literature — also depend on the answers to these questions. In a series of papers, my co-authors and I shed light on these questions by providing evidence for actual traded goods prices. Using micro-data on U.S. import and export prices at-the-dock for the period 1994 to 2009, we develop theoretical models that provide a better fit for the empirical evidence than earlier theoretical environments.

## Nominal and Real Rigidities in Traded Goods Prices

Significant nominal and real rigidities<sup>1</sup> in the pricing of traded goods

are shown in my work with Roberto Rigobon.<sup>2</sup> The median price duration in the currency of pricing is long at 10.6 (12.8) months for U.S. imports (exports). Also, 90 percent (97 percent) of imports (exports) are priced in dollars. In international macro models it is typically assumed that prices are either all rigid in the local currency (importer's currency) or in the producer's currency (exporter's currency), and this assumption is symmetric across countries. In the case of the United States, contrary to this assumption, we find local-currency pricing for imports and producer-currency pricing for exports. This suggests an asymmetry in terms of which country bears the costs/benefits of exchange rate movements. Given the long durations between price adjustment and with most goods prices sticky in dollars, the pass-through of exchange rate shocks into import prices is low in the short run. Interestingly though, even conditioning on a price change, bilateral exchange rate pass-through into U.S. import prices is low, at 22 percent. We further document that differentiated goods manufacturers exhibited marked stability in their trade prices during the Great Trade Collapse of 2008–9, despite the large decline in their trade volumes.<sup>3</sup>

The fact that the vast majority of import prices into the United States are rigid in dollars for a significant duration and that, even conditional on a price change, the response of dollar prices to exchange rate shocks is limited, implies that exchange rate movements produce between zero and small relative price effects over short- and medium-run horizons. This seriously limits the quantitative importance of the Friedman mechanism for the United States.

## Currency of Pricing and Pass-Through

The broader question of optimality of a floating-versus-a-pegged exchange rate has been researched extensively in open economy macroeconomics. The presence of nominal rigidities in price setting generates trade-offs between the two exchange rate regimes. In a large class of models used to evaluate optimal policy, the currency of pricing is assumed to be *exogenously* chosen. In the short run when prices are rigid, there is a 100 percent pass-through into import prices of goods priced in the producer's currency and a zero percent pass-through for goods priced in the local currency. When prices adjust, there is no difference in pass-through. Exogenous currency choice results in stark outcomes, like the optimality of floating exchange rates under producer-currency pricing which ensures expenditure switching, and pegging under local-currency pricing which preserves the law of one price. A fundamental question then follows: is pass-through unrelated to the currency of pricing when prices adjust?

Oleg Itskhoki, Rigobon, and I address this question both empirically and theoretically in a paper that uses novel data on currency and prices for U.S. imports.<sup>4</sup> We show that even conditional on a price change, there is a large difference in the pass-through of the average good priced in dollars (25 percent) versus non-dollars (95 percent), both across countries and within disaggregated sectors. We also show that sectors that would be classified as producing more homogenous goods, like mineral products, are dollar priced sectors while differentiated sec-

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tors, like machinery, have a greater share of non-dollar pricers. Further, non-dollar pricers adjust prices less frequently than dollar pricers. These findings are inconsistent with the assumption, in an important class of models, that the currency of pricing is exogenous. We then present a model of endogenous currency choice and show that the predictions of the model are strongly supported by the data. We depart from existing literature by considering a multi-period dynamic pricing environment and provide conditions under which a sufficient statistic for currency choice can be empirically estimated using observable prices.

These findings require revisiting the debate on optimal exchange rate policy. The stark trade-off between floating and pegged exchange rates arises because firms are forced to price in one or the other currency. Once firms are allowed to choose currency optimally, they will choose it to fit their desired pass-through patterns, enhancing the effective amount of price flexibility and reducing the welfare gap between floating exchange rates and pegs. Further, exchange rate volatility affects currency choice which in turn affects exchange rate volatility, generating the possibility for multiple equilibria. A country that follows more stable monetary policies will experience greater price stability because more of the exporters to that country set prices in its currency. These effects can be first-order relative to the standard trade-offs emphasized in the literature.

## Frequency of Price Adjustment and Pass-Through

The importance of studying micro data is ultimately being able to comprehend key aggregate phenomena, such as the sluggish response of prices to shocks, and to discern which models of price setting best fit the data in order to deduce the impact of micro price stickiness on output and welfare. Itskhoki and I advance this literature by developing a new comparison of exchange rate pass-through and frequency of price adjustment across goods.<sup>5</sup> We document that goods displaying a high frequency of price adjustment have

a long-run pass-through that is at least twice as high as low-frequency adjusters in the data. Next, we prove theoretically that in an environment with variable mark-ups there should be a positive relation between frequency and long-run pass-through, as in the data. Moreover, we show that standard models with constant elasticity of demand and Calvo or state-dependent pricing fail to match the data. When we deviate from this standard framework and calibrate a dynamic menu-cost model with variable mark-ups, we show that it has substantial success in matching the features of the data. The empirical findings highlight a new selection effect that has important implications for the welfare consequences of measured price rigidity.

## Bridging Closed and Open Economy Research on Real Rigidities

The closed and open economy literatures work on estimating real rigidities, but in parallel.<sup>6</sup> Itskhoki and I survey both literatures and highlight areas of agreement and disagreement. One surprisingly consistent result across several studies, surprising since these studies use different methodologies and data sets, is that strategic complementarities, for example operating through variable markups, play little role for retail prices and appear to be quite important for wholesale prices. We then estimate the extent of real rigidities using empirical procedures employed in the closed- and open-economy literatures and with a common international price dataset. We show that, consistent with the presence of real rigidities, the response of reset-price inflation<sup>7</sup> to exchange rate shocks depicts significant persistence. Individual import prices, conditional on changing, respond to exchange rate shocks prior to the last price change. At the same time aggregate reset-price inflation for imports, like that for consumer prices, shows little persistence. In general, across closed- and open-economy literatures, the response to a specific shock suggests a more important role for real rigidities

than the point estimate of the autocorrelation of reset prices. When we quantitatively evaluate sticky price models (Calvo and menu cost) with variable markups at the wholesale level, we find that they generate sluggishness in price adjustment and increase the size of the contract multiplier, but their effects are modest.

## Failure of the Law of One Price

Relative cross-border retail prices, in a common currency, co-move closely with the nominal exchange rate. This well-known fact has spurred a long literature that attempts to determine the sources of this co-movement. Three co-authors and I use a new dataset with product-level retail prices and wholesale costs for a large grocery chain operating in the United States and Canada and decompose this variation into relative wholesale costs and relative markup components.<sup>8</sup> We find that the correlation of the nominal exchange rate with the real exchange rate is driven mainly by changes in relative wholesale costs, arguably the most tradable component of a retailer's costs. This new finding suggests that the empirical evidence is inconsistent with the traditionally assumed pricing-to-market at the retail level, but is consistent with pricing-to-market at the wholesale level. We then measure the extent to which national borders impose additional costs (over domestic costs) that segment markets across countries. We show that retail prices respond to changes in wholesale costs in neighboring stores within the same country but not to changes in wholesale costs in a neighboring store located across the border. Using a regression discontinuity design, we find a median discontinuous change in retail and wholesale prices of 24 percent at the international border. By contrast, the median discontinuity is zero for state and provincial boundaries, consistent with important "border effects".

## Summary

International prices of traded goods, as represented by U.S. imports and exports, demonstrate about one year of

nominal rigidity even in the face of volatile exchange rates. And even when prices adjust, they respond only partially (22 percent) to bilateral exchange rate shocks in the first adjustment. After further price adjustments, the cumulative pass-through is around 34 percent into U.S. import prices. However, there is a sharp difference in dollar pass-through, conditional on first and long-run adjustment, between prices that are rigid in dollars versus a foreign currency. Basically, prices in whichever currency they are set respond partially to exchange rate shocks at most empirically estimated horizons. This fact is consistent with low aggregate pass-through of exchange rate shocks into U.S. prices because most U.S. imports are priced in dollars. On the other hand, for most developing countries, pass-through into local currency prices is high because most of their imports are priced in a foreign currency, dollars.

These findings, along with, the positive correlation between the frequency of price adjustment and pass-through, suggest an important selection effect that drives currency choice and the frequency of adjustment. The variables that define the choice depend on the desired (flexible price) exchange rate pass-through of goods, which in turn depends on

the degree of strategic complementarity in pricing across goods and the sensitivity of costs to exchange rate shocks. Given this selection effect, the profit/losses associated with sub-optimal prices during periods of non-adjustment can be small and the gains to exchange rate flexibility can be limited.

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<sup>1</sup> The term “real rigidities” is used to capture reasons why firms do not want to move their price relative to the industry price level by much, even when they can adjust prices. For an early discussion, see L. Ball and D. Romer, “Real Rigidities and the Non-Neutrality of Money,” NBER Working Paper No. 2476 (Also Reprint No. r1437), July 1990, and *The Review of Economic Studies*, 57(2) (April 1990) pp. 183–203.

<sup>2</sup> G. Gopinath and R. Rigobon, “Sticky Borders,” NBER Working Paper No. 12095, March 2006, and *Quarterly Journal of Economics*, 123(2) (May 2008) pp. 531–75.

<sup>3</sup> G. Gopinath, O. Itskhoki, and B. Neiman, “Trade Prices and the Global Trade Collapse of 2008–09,” NBER Working Paper No. 17594, November 2011.

<sup>4</sup> G. Gopinath, O. Itskhoki, and R.

Rigobon, “Currency Choice and Exchange Rate Pass-through,” NBER Working Paper No. 13432, September 2007, and *American Economic Review*, 100(1) (March 2010) pp. 304–36.

<sup>5</sup> G. Gopinath and O. Itskhoki, “Frequency of Price Adjustment and Pass-through,” NBER Working Paper No. 14200, July 2008, and *Quarterly Journal of Economics*, 125(2) (May 2010) pp. 675–727.

<sup>6</sup> G. Gopinath and O. Itskhoki, “In Search of Real Rigidities,” NBER Working Paper No. 16065, June 2010, and in *NBER Macroeconomics Annual 2010, Volume 25*, D. Acemoglu and M. Woodford, eds. (Chicago: University of Chicago Press Journals, 2011), pp. 261–309.

<sup>7</sup> “Reset price inflation” is inflation that is calculated from the sample of prices that have changed.

<sup>8</sup> G. Gopinath, P-O. Gourinchas, C-T. Hsieh, and N. Li, “Estimating the Border Effect: Some New Evidence,” NBER Working Paper No. 14938, April 2009, and as G. Gopinath, P-O. Gourinchas, C-T. Hsieh, and N. Li, “International Prices, Costs and Markup Differences,” *American Economic Review*, 101(6) (October 2011) pp. 2450–86.

## Time Use

### Daniel S. Hamermesh\*

Until 2000, economists paid scant attention to distinctions in how people used their time other than between working for pay and not working. In part,

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that neglect stemmed from the realization that this simple distinction was of central importance for economic growth, unemployment, and tax policy. There was also the belief that changes in the mix of non-market activities would not affect market outcomes; and finally, there was a paucity of data on time use outside the labor market. Yet not all time away from work is the same: most people would rather watch television than wash dishes, for example.

We are now rapidly going beyond the simple work/non-work distinction, spurred partly by the burgeoning in many countries of large random samples describing people’s time use. These “time diaries” record the previous day’s activities, either in specific categories or with free descriptions that are then categorized by a statistical agency. The United States, which had been a laggard in developing these data, is now a leader:



since 2003 the U.S. Bureau of Labor Statistics has produced its American Time Use Survey (ATUS), containing diaries kept by roughly 1000 adults each month. Many of the findings discussed in this article are based on analyses using the ATUS.

## Time at Work, Chores, and Leisure

There is pretty good evidence that paid work time has not changed greatly in the United States in the past four decades. Men are working less, women more. But until the advent of large-scale time use surveys in the United States, we could not know how time outside work has changed. Are we engaging in more leisure activities? Spending more time caring for our children, aged parents, houses, pets—things that we could pay somebody to do for us, what we call household production? Put bluntly, are we having more fun, or just doing more unpaid work-like activities?

Economists are now able to answer these questions. Of course, the answers depend on how we define non-work activities. The general trends seem pretty clear, though: 1) Time diaries corroborate the conclusions from household surveys in which people respond to questions about how many hours they worked in the past week. On average, there has been little change in paid work time, with men cutting back on work, women increasing it, but not to men's levels. 2) Since 1965, time spent in household production activities has dropped. But that decline hides sharply different trends by gender: women are spending less time on household production, men more, but still less than women. Defining total work as work-for-pay-plus-household-production, it is clear the total has dropped since the mid-1960s in the United States. 3) Although the sources of men's and women's newly free time differ, both sexes are now spending more time in leisure activities. Whether we're happier or not, we are more involved in activities that most people would regard as leisure.<sup>1</sup>

This increase in leisure time has not been spread evenly among all adult Americans. Among college graduates, leisure has hardly increased at all. For those who made it only to or through high school, there have been large increases in leisure time. These differences should make one think about the net effects of the sharp rises in earnings and income inequality that have occurred in the United States over these decades. While the rich and well-educated have gotten richer, they have no more leisure time in which to enjoy their income. Lower-income people have not done so well financially, but they have a lot more time over which to spread the smaller income increases that they have experienced.<sup>2</sup>

Who is working more in total, men or women? Put differently, who is enjoying more leisure, men or women? In a large number of wealthy countries there is little or no difference—men's extra work for pay is almost exactly offset by women's extra household work. This near equality does not hold in poorer countries, though, where women work much more in total than men. Similarly, the same greater work burden on women occurs in countries where surveys describing citizens' attitudes suggest that men have more power than elsewhere.<sup>3</sup>

As Table 1 shows, in the United States between 2003 and 2009 men

worked in total an average of 495 minutes on a typical day, women 505 minutes. Men spent more time in leisure (mainly because they watched more television), women more time in personal maintenance. But the times spent outside of work and household chores were nearly equal.

With the sudden abundance of time-use data in the United States and the ability to make longer-term comparisons, we can now answer questions about changes in various demographic groups' use of time and differences among them. College students are spending less time studying and attending class than before, even accounting for demographic changes in their gender/racial/ethnic/background mix. Immigrants use time differently from natives, being no more likely to work for pay but working more if they do choose to work. They are less likely to do things at all that require dealing with the native world, but spend more time on them if they do them at all. This difference disappears among second-generation Americans.<sup>4</sup>

People who are better-educated and have greater earnings capacity tend to sleep less, which is not surprising since their time is more valuable. However, while the greater value of time reduces time spent on many other non-work activities, additional education may

**Table 1 — Time Use by Americans Ages 20-64: Minutes per Representative Day, 2003–2009\***

	<b>Men</b>	<b>Women</b>
<b>Market Work</b>	340	241
<b>Household production</b>	155	264
<b>Personal maintenance**</b>	616	635
<b>Leisure</b>	329	300

\*Based on ATUS samples of 31,614 women, 24,742 men.

\*\*Most of "personal maintenance" is sleep.

reverse this effect for some people: the better educated may realize the benefits of such activities as exercise, health management, and other things. In fact, this latter effect seems to predominate—time spent exercising rises with education, even though more educated people have less leisure time.<sup>5</sup>

How we use time outside of work is especially important in parenting. With the rise of dual-earner couples as women's labor force participation rates have increased, one might worry that kids are not getting the same attention as earlier. Working parents may indeed be spending less time parenting than employed parents used to—the evidence on that is unclear. But reliance on alternative scheduling—with one spouse working a non-standard schedule—has increased, allowing for the possibility that one parent can typically spend time with the child (or children). The interesting development is that time spent with kids has increased especially sharply among more educated parents. With those parents also increasing their market work, this change is surprising. One possible explanation, consistent with the data, is that increased competition for entry into elite colleges has spurred parents to spend more time with kids in hopes of raising their chances of acceptance at leading universities—the Tiger Mom phenomenon.<sup>6</sup>

The notion of household production goes back at least to the early 1930s, but the formal theory was laid out by Gary Becker in 1965. He noted that families are like little factories, combining their own time and purchased goods to create commodities that they can then enjoy.<sup>7</sup> The power of the theory stems from the implications of the fact that while we all pay about the same prices for purchased goods, our values of time differ greatly. While household production is mentioned in the research discussed here, most of the studies—and the immense literature by sociologists who examine time use—involves accounting, that is, listing patterns of time use rather than using the theory to uncover new economic relationships.

One study explicitly used the theory

to measure how people substitute food and other purchases for time as their time became more valuable. In the United States between 1985 and 2003, time devoted to food purchasing, preparation, and clean-up, and eating, decreased as people's wages increased. The decrease was especially pronounced among the well-off, whose wages increased most. Another study used the theory to examine the hoary but crucial economic question of how tax changes affect women's market work time. Going beyond the standard work-non-work distinction, the evidence shows that most of the impact of changing incentives for paid work operates through decreases in household production; these are modified by changes in the prices of purchased goods that are most readily substituted for a woman's time at home.<sup>8</sup>

One issue that has intrigued social psychologists, the so-called “third shift” of high-earning women and men who feel frazzled and always rushed for time, also has been studied using the theory. High wages lead people to work more, leaving less time to enjoy with purchased goods. Those same people also have more money to spend. For these well-off people, time is scarce and purchased goods are plentiful; so it is not surprising that, even if they did little paid work, they complain about not having enough time (just as it is not surprising that low-income people complain less about being short of time, more about being short of money).<sup>9</sup>

### When We Do Things, and the Macroeconomy

All of these studies discuss *how much* time is devoted to different activities, but *when* we do things also matters. For example, Americans do more paid work on weekends and at night than workers in other rich economies. Would this pattern change if the government imposed large penalties on work at unusual times? Work at such times probably would be reduced, but the responses would not be enough to get American work schedules in line with those in Europe and Japan. When we work also depends on when

others are working—and what good alternatives exist to working. The timing of television shows affects when we work: because shows are nominally one hour later in the East, people living there start and end work later and go to sleep later than people in the Midwest. The timing of work, sleep, and other activities among people in other time zones is cued partly by those in the eastern time zone (where nearly half of all Americans reside).<sup>10</sup>

We know that the average American is less likely to be working for pay in a recession, especially a severe one, if working means putting in fewer hours. But is the freed-up time then used for household production—on chores that might have been postponed from good times and that might even substitute for purchased services—or is it used for leisure or personal maintenance? With the ATUS now providing enough data to answer this question, the evidence shows that only part of the extra time is reallocated to household production. This fact implies that a recession does not just represent substitution of non-market for market production; it represents a real loss of goods and services, whether they are produced in the market or at home.<sup>11</sup>

Although paid work time decreased in the United States in the first half of the twentieth century, and in Europe during the third quarter of that century, those drops were gradual and their causes are hard to sort out. How would we spend time if we suddenly were forced to work less, so that our unusually long work time decreased to levels of other rich countries? Japan and Korea both cut working time by raising the penalties that employers pay for using overtime hours. Almost none of the freed-up time was used for additional household production, with extra TV-watching and grooming taking up much of the extra non-work time.<sup>12</sup> Again, household production did not substitute completely for paid work.

The development of large-scale household surveys in the 1960s and 1970s enabled a boom in studies that linked empirical research to the theory

of individual behavior. I expect that, as still more time-use data become available in the United States and other countries, more research will take advantage of the unique perspective that economic theory provides into issues of time allocation. The data will be there awaiting the clever application of theory to generate new facts.

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# Risk and the Consumption, Saving, and Portfolio Choices of American Households

Jonathan A. Parker\*

In the past few years, U.S. households have faced an enormous amount of macroeconomic uncertainty. The financial crisis, the Great Recession, and the European debt crisis together have caused large changes in asset prices and incomes, increases in market volatility, and significant uncertainty about government policies. My research considers how consumption and saving behaviors respond to risk and to government policies, as well as how the risks that households face are evolving. Here I discuss four topics more specifically: How do households allocate their savings in response to different risks across different stocks? How do households (mis) perceive risk and how does this affect their behavior? How effective was the government stabilization policy of distributing tax rebates at generating household spending? And how have changes in the labor market and increasing inequality in particular changed which households bear macroeconomic risks?

## Saving, Portfolios, and Risk

Different types of stocks traded on the U.S. stock market can exhibit quite different average returns over long periods, differences that persist out of sample, are highly statistically significant, and can be as much as 10 percent per year. Such differences ought to be understandable from the saving and portfolio choices of households, choices which in turn presumably are determined by differences in the riskiness of different stocks. That is,

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people should pay less for stocks that are more risky, and we should observe risky stocks on average earning higher rates of return. But then the key issue becomes how we measure riskiness.

The central view in economics is that people save to support future consumption, which implies that we should be able to explain differences in expected returns across stocks by the risk that each investment poses for future consumption, or equivalently by the extent to which people's spending on consumption drops when the return is low and rises when the return is high. Such risky stocks are said to have high "consumption betas." Unfortunately, this theory does not work well in many dimensions. Groups of stocks with quite different average returns have similar consumption risk (betas). And the average returns on the stock market as a whole (relative to safe, short-term interest rates) are too large to be justified by its consumption risk, unless households are assumed to be implausibly risk averse.

My own work argues that in evaluating this theoretical insight—that consumption risk determines how attractive an asset is and thus its price and average return—it makes more sense to measure ultimate consumption risk rather than the usual contemporaneous consumption risk. I find that ultimate consumption risk largely does explain expected returns on stocks. The argument is that when a stock declines, measured consumer spending may take a while to fall for reasons that range from delay in measurement to hard-to-adjust commitments to spend to inattention or near rationality. The finding starts by defining ultimate consumption risk as the change in consumption over a three-year horizon that includes and follows a return that occurs over three months. Three years seems the right bal-

ance between the increased signal about consumption risk from a longer horizon and the greater mis-measurement of consumption risk that comes from overlapping data and unexpected movements of consumption following an asset return.

I show that measures of the ultimate consumption risk of the stock market come closer to making the consumption-based understanding of portfolio choice consistent with observed total stock market returns. I find that the ultimate consumption risk of the stock market is about six times what was previously measured by contemporaneous consumption risk.<sup>1</sup> Furthermore, considering only the ultimate consumption risk of those households that actually participate in the stock market yields an even higher measure of consumption risk.<sup>2</sup> Finally, market returns are higher following periods in which ultimate consumption risk is higher, although that relationship is statistically weak.<sup>3</sup>

Returning to the wide differences in average returns across different stocks, Christian Julliard and I show that ultimate consumption betas do a good job of explaining the differences in expected returns across stocks.<sup>4</sup> Differences in ultimate consumption risk (a single factor) line up well with differences in average returns across the Fama and French 25 portfolios and explain as much of the variation as the Fama-French (three) factor model constructed from these returns to price these portfolios.<sup>5</sup> This finding implies that the differences in average returns known as the value premium and the size premium are actually largely consistent with portfolio choice following from ultimate consumption risk, with one exception. The exception is that the risk aversion implied by this exercise still remains too large to satisfactorily explain differences in returns from



portfolio choices in the canonical consumption-based model. Thus, it seems the theory has some truth to its model — consumption risk matters — but maybe not enough.

Research on asset pricing is continuing by developing more complex models of how consumption maps into riskiness. In these models, the marginal value of consumption in a state of the world, or the state price, is not based only on consumption in that state of the world, but also on other factors, such as anxiety in that state of the world about risk to future consumption.<sup>6</sup>

## Perceptions of Risk and Reactions to Risk

My own work has focused not on modeling how anxiety varies across states of the world but instead on how people's optimism varies and how this in turn affects (among other things) portfolio choices and asset prices. My co-authors and I build an economic model of situational biases in beliefs and explore its behavioral implications.<sup>7</sup> We assume that people have a natural bias towards optimism because it provides a straightforward way for them to raise their expected discounted value of utility. This optimism however is tempered by the severity of the mistakes to which it would lead, leading to an equilibrium bias in beliefs that affects their behavior.

Consistent with much experimental evidence on probability assessments, our assumptions imply that optimism is pervasive because a small bias in beliefs typically leads to first-order gains attributable to increased anticipatory utility, and only to second-order costs attributable to distorted behavior. Our model implies that biases in expectations are situational. They are less rational when biases have little cost in realized outcomes, or when biases have large benefits in terms of expected future happiness. Markus Brunnermier, Filippos Papakonstantinou, and I show that this approach is consistent with observed optimism concerning task completion and evidence on how environmental factors mitigate this prob-

lem and lead to better task completion.<sup>8</sup>

Our general approach also provides insights into a number of sometimes puzzling patterns of observed household investment choices and the risks and returns of assets.<sup>9</sup> In a general equilibrium model with complete markets, 1) because the cost of biased beliefs are second-order, investors hold biased assessments of probabilities and so are not perfectly diversified according to objective metrics; 2) because the costs of biased beliefs temper these biases, the ex post costs of the lack of diversification are limited; 3) because there is a complementarity between believing a circumstance more likely and purchasing more of the asset that pays off in that circumstance, investors over-invest in assets that pay off in one future state of the world and otherwise insure their consumption well; 4) because different households can settle on different states of the world to be optimistic about, optimal portfolios of ex ante identical investors can be heterogeneous; 5) because low-price and low-probability outcomes are the cheapest to gamble on, optimism about these states distorts consumption the least in the rest of the states, so that investors tend to overinvest only in the most positively skewed securities; 6) finally, because investors have higher demand for more skewed assets, more skewed assets can have lower average returns.

While our theory is probably not ready for quantitative prediction, some of its insights are consistent with more recent analyses of what asset markets tell us about how households respond to risk.<sup>10</sup>

## Saving, Spending, and Fiscal Stabilization Policy

Switching gears from how risk affects the way people allocate their savings to how much people choose to consume and save, my co-authors and I have studied how spending responds to changes in tax policy that induce large predictable changes in people's after tax incomes. This issue has generated a lot of interest lately, as the U.S. government has recently lowered taxes and distributed stimulus

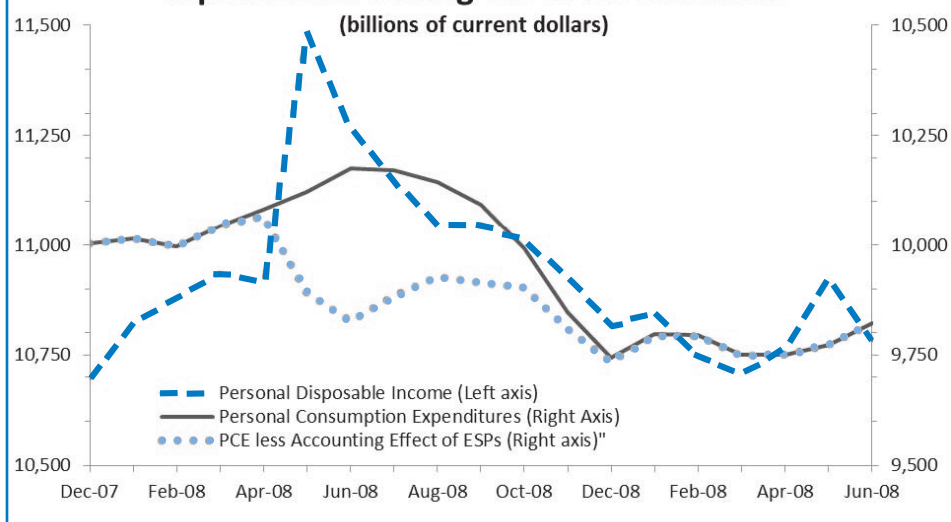
payments with the intention of raising consumer demand.

In theory, these types of policies might be futile. Tax changes that lead to offsetting increases in future taxes, or reductions in future benefits, have little effect on people's lifetime incomes and so might lead to little adjustment in spending. And pre-announced temporary tax changes that do not change tax distortions might lead only to small persistent adjustments to spending upon announcement and no changes when the funds are distributed. In practice, however households do seem to respond significantly to some tax changes that lead to predictable, temporary changes in after tax income. Using variation in the timing of when households hit the Social Security tax cap during a calendar year, I find large spending increases around the time of the income increases.<sup>11</sup>

But the bigger question is the size of spending responses to policies specifically designed to stimulate spending in recessions. In both the summer of 2001 and the spring-summer of 2008, the Federal government sent out billions of dollars of tax rebates or economic stimulus payments in the hopes of stimulating aggregate demand. In each instance, the timing of the distribution of the payments was based on the second-to-last digit of the Social Security number of the tax filer who received it, a digit that is effectively randomly assigned. The policy experiment provided by the randomized mailing dates allows my co-authors and me to identify the causal effect of the receipt of a rebate on household spending by comparing the expenditures of households who received rebates at different times. Of course to do this, one has to have information on household expenditures, and we worked with the Bureau of Labor Statistics and other government agencies which did commendable work adding survey modules about the stimulus payments on short notice to their existing survey of household expenditures.<sup>12</sup>

We find that in both 2001 and 2008, households spent roughly a quarter of their rebate payments on a broad measure of nondurable spending. The cir-

## Disposable Income and Consumption Expenditures During the Great Recession



cumstances in each recession were different however, and other features of the responses were less similar. For example, in the summer of 2008, gas prices had just risen significantly, and we find that more than a third of the stimulus payments were spent on purchases of new cars, whereas no significant amount was spent on cars in 2001.

Our research does not allow us to infer how the economy would have behaved without the payments, but it does measure the initial change in aggregate demand for consumption caused by the distribution of the payments. The household-level spending response estimated in our work implies that the aggregate change was large, around 2 percent of personal consumption expenditures (PCE) in the peak quarter. The figure above shows monthly disposable personal income, PCE, and PCE-less-our-estimated-initial-demand-effect of the 2008 economic stimulus payments. The vertical axes each span a trillion dollars, so income and consumption scales are comparable. The increase in disposable income from the stimulus payments in May, June, and July is clearly visible (dashed line). Our estimates imply that the spending response to the payments was not immediate but, as the difference between the solid and dotted lines shows, the policy was a substantial contributor to

strong consumption demand in the summer of 2008. While our research does not quantify the general equilibrium impact of the stimulus payment program—the size of the multiplier and the ultimate magnitude of its impact on GDP and employment for example—in other work I argue for using experiments like this to increase the accuracy of macroeconomic models of such policies. Our results can help researchers to better model steps in the causal chain from policy to the economy, critical components of any model of macroeconomic policy, which are often only weakly identified in current empirical investigations.<sup>13</sup>

### The Rising Risk of High Incomes

The recession of 2008–9 was deep and unexpected, and in recent work Annette Vissing-Jorgensen and I investigate how it affected the incomes of high-income households relative to middle-income households. We find that the business cycle exposure of the income of the top 1 percent of households has changed in fundamental ways. Further, this change seems closely related to recent increases in inequality and thus is potentially illuminating about why economic inequality in our society is rising.

We know from previous research that

since the early 1980s there has been a large increase in the share of aggregate income received by households at the very top of the income distribution.<sup>14</sup> We show that at the same time, the business-cycle exposure of the earnings of these high-income households has risen dramatically.<sup>15</sup> Since the early 1980s, the income of those in the top 1 percent of the income distribution has averaged 14 times average income and been 2.4 times *more* cyclical; prior to the early 1980s, the income of the top 1 percent averaged nine times average income and was slightly *less* cyclical than that of the average household. Thus, top incomes now rise much more than average in booms and fall much more in recessions, where prior to 1980, they rose and fell less than average.

One interesting question is whether high-income households use other assets to insure this higher level of income risk. We show that they do not. Looking at spending instead of income, we also find higher exposure for the *spending* of high income households (as best we can measure it). Thus it is likely that high-income households now bear a greater share of macroeconomic risk than they used to. Analogous to the use of the term “high-beta” to describe stocks that have high exposure to risk (as discussed above), our findings have spawned the term the “high-beta rich” to describe the new high exposure of high-income households to macroeconomic risk.<sup>16</sup>

Why have the incomes of high-income households become more exposed to macroeconomic risk? While the field is far from a definitive answer, our research suggests a link between this increase in exposure to macroeconomic risk and the increase in the share of income earned by the top 1 percent. The rise in the exposure of top incomes to booms and recessions not only starts at the same time as the rise in the top’s share of total income, but we also show that greater top-income share is associated with greater top-income exposure across decades, across subgroups of top incomes, and, in changes, across countries. This close relationship suggests a common cause and does not directly support the

idea that the increase in inequality comes from slowly changing social norms about pay, or from the idea that lower income tax rates have caused a boom in top earnings. We put forward the possibility that information and communication technologies have caused both changes by increasing the optimal production scale of the most talented and increasing the exposure of profits from these activities to macroeconomic fluctuations.

Note that neither this theory nor our findings imply that high-income households suffer more in recessions, nor do they imply that the disproportionately higher incomes of the top 1 percent are associated solely with greater production of socially valuable output.

In conclusion, my research on the ways in which households respond to risk, to government transfers in recessions, and to income risks give us clues to the determinants of asset returns, how effective anti-recessionary policies are, and what is driving recent increases in income inequality.

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<sup>13</sup> J.A. Parker, “On Measuring the Effects of Fiscal Policy in Recessions,” NBER Working Paper No. 17240, July 2011, and *Journal of Economic Literature*, 49(3), September 2011, pp. 703–18.

<sup>14</sup> See T. Piketty and E. Saez, “Income Inequality in the United States, 1913–1998,” NBER Working Paper No. 8467, September 2001, and *Quarterly Journal of Economics*, 118(1), February 2003, pp. 1–39.

<sup>15</sup> J.A. Parker and A. Vissing-Jorgensen, “The Increase in Income Cyclicalities of High-Income Households and its Relation to the Rise in Top Income Shares,” NBER Working Paper No. 16577, December 2010, and *Brookings Papers on Economic Activity*, 41(2), Fall 2010, pp. 1–55, and J.A. Parker and A. Vissing-Jorgensen, “Who Bears Aggregate Fluctuations and How?” NBER Working Paper No. 14665, January 2009, and *American Economic Review*, 99(2), May 2009, pp. 399–405.

<sup>16</sup> Coined by Robert Frank in R. Frank, *The High-Beta Rich: How the Manic Wealthy Will Take Us to the Next Boom, Bubble, and Bust*, Random House, New York NY, 2011.

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<sup>1</sup> J.A. Parker, “The Consumption Risk of the Stock Market,” *Brookings Papers on Economic Activity*, 2, 2001, pp. 279–348.

<sup>2</sup> This is found both in Parker (2001) and in Y. Ait-Sahalia, J.A. Parker, and M. Yogo, “Luxury Goods and the Equity Premium” NBER Working Paper No. 8417, August 2001, and *Journal of Finance*, 59(6), December 2004, pp. 2959–3004.

<sup>3</sup> J.A. Parker, “Consumption Risk and Expected Stock Returns,” NBER Working Paper No. 9548, March 2003, and *American Economic Review*, 93(2), May 2003, pp. 376–382.

<sup>4</sup> J.A. Parker and C. Julliard, “Consumption Risk and the Cross-Section



# Raising Capital Amid Uncertainty about Financial Market Conditions

Michael S. Weisbach\*

The ability of financial markets to provide capital to firms as efficiently as the textbooks describe is an important factor in determining corporate profitability, and economic welfare more broadly. Equally important, the recent “Financial Crisis” has shown that financial markets vary substantially over time in their ability to provide capital: sometimes they get “overheated” and provide too much capital, while at other times they slow down and do not provide enough capital. Much of my recent research is related to this topic. I study both the factors that affect firms’ access to capital and the implications of uncertain access to capital for corporate behavior.

## Factors that Affect Access to Capital

The Financial Crisis substantially reduced firms’ ability to access capital markets. Using data from before the Crisis, Isil Erel, Brandon Julio, Woojin Kim, and I consider whether this was an isolated occurrence, or an extreme example of a more general phenomenon.<sup>1</sup> Do macroeconomic conditions affect firms’ abilities to raise capital, and if so, how do they affect the manner in which the capital is raised? We address these questions using a large sample of publicly-traded debt issues, seasoned equity offers, bank loans, and private placements of equity and debt. Our results suggest that a borrower’s credit quality significantly affects its ability to raise capital during macroeconomic downturns. For non-investment-grade borrowers, raising capital tends to be pro-cyclical; for investment-grade borrowers, it is countercyclical. Moreover, the proceeds raised by invest-

ment-grade firms are more likely to be held in cash during recessions than in expansions. Poor market conditions also affect the structure of securities offered, shifting them towards shorter maturities and more safety. Overall, our results suggest that macroeconomic conditions influence the securities that firms issue to raise capital, the way in which these securities are structured, and indeed firms’ ability to raise capital at all. This influence likely occurs primarily through the effect of macroeconomic conditions on the supply of capital.

The Financial Crisis also made evident the importance of financial innovation, and in particular securitization, in the ability of firms to access capital markets. Taylor Nadauld and I directly estimate the effect of securitization on firms’ cost of capital.<sup>2</sup> Our results suggest that loan facilities which are subsequently securitized are associated with a 17-basis-point lower interest cost than loan facilities which are not subsequently securitized. We also consider what characteristics are associated with the likelihood of securitization and then estimate how these characteristics are related to interest rate spreads. Our research shows that Term Loan B facilities, facilities of B-Rated firms, and facilities originated by banks that issue Collateralized Loan Obligations (CLOs) are securitized more frequently than other facilities. The facilities that we estimate to be more likely to be subsequently securitized have lower spreads than otherwise similar facilities. These results are consistent with the view that securitization reduces the cost of capital.

One change in the financial markets in recent years has been the increasing importance of institutional investors, who have played a significant role in providing capital. Jongha Lim, Bernadette Minton, and I study the way in which institutions, when they are equity holders

in a firm, increasingly have become lenders to the firm as well.<sup>3</sup> We argue that in this situation, institutions have provided capital to firms in situations in which they could not otherwise access the capital market. In our sample of 11,137 tranches of institutional “leveraged loans” occurring between 1997 and 2007, over 2,000 of them (18 percent) have a non-commercial bank institution that also owns at least 0.1 percent of the firm’s equity. Such “dual holder” loan tranches have higher spreads than otherwise similar loan tranches without participation of an equity holder. The premium is present for both revolver and term loans, and exists within all non-investment grade rating classes. Contrary to risk-based explanations of this finding, we find that a dual holder tranche is priced at a premium to other tranches of the same loan package, after controlling for tranche specific characteristics, even though they share the same underlying fundamentals. Dual holding premiums are higher when the equity-holder’s stake is larger and when the equity holder is a hedge fund or a private equity fund. These findings are consistent with the view that equity holding institutions provide capital to firms in situations in which they are having difficulty accessing capital markets, and that the premiums represent compensation they receive in exchange for providing capital in these circumstances.

## The Impact of Uncertain Access to Capital on Firms’ Activities

Given that firms’ access to capital is substantially more uncertain in practice than is predicted by standard economic textbook models, how should firms react? What aspects of their operational and financing decisions are likely to be affected? Heitor Almeida, Murillo Campello, and I study this question in a model of firm’s investment behavior in

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the presence of potential future financing constraints.<sup>4</sup> Our model suggests that a greater likelihood of future financing constraints leads firms to have a preference for investments with shorter payback periods, investments with less risk, and investments that use more assets that can be pledged. The model also shows how investment distortions towards more liquid, safer assets vary with the marginal cost of external financing and with the firms' internal cash flows. Our theory helps us to reconcile and interpret a number of patterns reported in the empirical literature, in areas such as risk-taking behavior, capital structure choices, hedging strategies, and cash management policies. For example, consistent with the empirical evidence of Andrade and Kaplan (1998) and Rauh (2009) but contrary to the famous arguments of Jensen and Meckling (1976), we show that firms are likely to reduce rather than to increase risk when leverage exogenously increases.<sup>5</sup> Furthermore, firms in economies with less developed financial markets will not only undertake less investment, but they will also undertake different kinds of investment by focusing on safer, short-term projects that are potentially less profitable. We also point to several predictions that have not been examined empirically. For example, our model predicts that investment safety and liquidity are complementary: constrained firms are especially likely to decrease the risk of their most liquid investments.

Our evidence on behavior in the face of financial constraints suggests one way that economists can identify which firms are likely to face such constraints. In particular, this theory along with earlier work I did with Almeida and Campello suggests that constrained firms, unlike unconstrained firms, will save a positive fraction of the cash flows they generate to finance their future investment.<sup>6</sup> This "cash flow sensitivity of cash" provides an easy method for evaluating whether a particular firm's managers believe that they will be facing financial constraints in the future. A positive estimate of the marginal propensity for a firm to

save cash out of incremental cash flows indicates that a firm is likely to be constrained, while a zero estimate indicates that it is likely to be unconstrained. Our empirical work, as well as that of others, indicates that this approach leads to a classification of constrained firms that is consistent with other evidence on firms' financial constraints.

Erel, Yeejin Jang, and I use this methodology to measure the extent to which financial constraints are relieved when firms are acquired.<sup>7</sup> This is an interesting question because managers often claim that an important source of value in acquisitions is the acquiring firm's ability to finance investments for the target firm. This claim implies that targets are financially constrained prior to being acquired and that these constraints are eased following the acquisition. We evaluate the extent to which mergers lower financial constraints using a sample of 5,418 European acquisitions occurring between 2001 and 2008. Each of these targets remains a subsidiary of its new parent, so we can observe the target's financial policies following the acquisition. We ask whether these post-acquisition financial policies reflect improved access to capital. We find that the level of cash held by target firms, the sensitivity of cash to cash flow, and the sensitivity of investment to cash flow all decline significantly, while investment increases significantly, following the acquisition. These findings are consistent with the view that easing financial frictions is a source of value that motivates acquisitions.

One sector that appears to be particularly sensitive to financial market conditions is private equity. Liquid debt markets are widely believed to be important drivers of the buyout booms in both the 1980s and 2000s. Ulf Axelson, Per Stromberg, and I develop a model that explains the relation between capital market conditions and buyout activity.<sup>8</sup> This model also has a number of additional predictions that explain how private equity contracts are structured in response to, among other things, the uncertainty about future capital mar-

ket conditions. In our model the financial structure minimizes agency conflicts between fund managers and investors. Relative to financing each deal separately, raising a fund in which the manager receives a fraction of aggregate excess returns reduces incentives to make bad investments. Efficiency is further improved by requiring funds to also use deal-by-deal debt financing, which becomes unavailable in states where internal discipline fails. In this model, private equity investment is highly sensitive to economy-wide availability of credit, and investments in bad states outperform investments in good states. The model, which is derived from agency and information problems in the presence of uncertainty about financial market conditions, explains a number of observed stylized facts about the private equity industry, both in terms of the contractual structure between limited partners, general partners, and portfolio firms, and around the quantity and performance of their investments over time.

Axelson, Tim Jenkinson, Stromberg, and I test the prediction of this model using detailed data on the financing of 1,157 worldwide private equity deals occurring between 1980 and 2008.<sup>9</sup> We find that buyout leverage is cross-sectionally unrelated to the leverage of matched public firms and is largely driven by factors other than what explains leverage in public firms. In particular, the economy-wide cost of borrowing is the main driver of both the quantity and composition of debt in these buyouts. Credit market conditions also have a strong effect on prices paid in buyouts, even after controlling for prices of equivalent public market companies. Finally, we find evidence that highly leveraged transactions tend to be associated with lower fund returns, controlling for fund vintage and other relevant characteristics. The results are consistent with the view that the availability of financing affects booms and busts in the private equity market, and agency problems between private equity funds and their investors can have an effect on buyout capital structures.

## Summary

My research has examined both the factors affecting firms' access to capital and the implications of potential future financial constraints on firms' behavior. Macroeconomic conditions have a large impact on the way in which firms raise capital, and on how much capital they raise. In addition, financial innovation and the identity of a firm's equity holders can be an important influence on firms' access to capital markets.

Uncertainty about whether a firm will be able to raise capital in the future can influence firms' financial policies, as well as its real investments. Particularly noteworthy is the effect of uncertainty about future capital market conditions on a firm's cash policy; the firm's "cash flow sensitivity of cash" will vary systematically depending on managers' perceptions of future financial market conditions. In addition, this uncertainty about financial markets affects the very boundaries of the firm, because it appears to be an important driver of acquisition decisions. Finally, uncertainty in capital market conditions is an important factor in understanding private equity firms, both in terms of how they are structured contractually and also about the tim-

ing, pricing, and performance of their investments.

<sup>1</sup> I. Erel, B. Julio, W. Kim, and M. S. Weisbach, "Macroeconomic Conditions and Capital Raising," NBER Working Paper No. 16941, April 2011, and Review of Financial Studies, 25, February 2012, pp. 341–76.

<sup>2</sup> T. Nadauld and M. S. Weisbach, "Did Securitization Affect the Cost of Corporate Debt?" NBER Working Paper No. 16849, March 2011, and Journal of Financial Economics, forthcoming.

<sup>3</sup> J. Lim, B. Minton, and M. S. Weisbach, "Equity-Holding Institutional Lenders: Do They Receive Better Terms?" NBER Working Paper No. 17856, February 2012.

<sup>4</sup> H. Almeida, M. Campello, and M. S. Weisbach, "Corporate Financial and Investment Policies when Future Financing is not Frictionless," NBER Working Paper No. 12773, December 2006, and Journal of Corporate Finance, 17, June 2011, pp. 675–93.

<sup>5</sup> G. Andrade and S. Kaplan, "How Costly is Financial (not Economic) Distress? Evidence from Highly Leveraged Transactions that Became Distressed," NBER Working Paper No. 6145, August

1997, and Journal of Finance 53, 1998, pp. 1443–94; J. Raub, "Risk Shifting versus Risk Management: Investment Policy in Corporate Pension Plans," NBER Working Paper No. 13240, July 2007, and Review of Financial Studies 22(7), 2009, pp. 2687–2734; M. Jensen and W. Meckling, "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure," Journal of Financial Economics, (1976).

<sup>6</sup> H. Almeida, M. Campello, and M. S. Weisbach, "The Cash Flow Sensitivity of Cash," NBER Working Paper No. 9253, October 2002, and Journal of Finance, 59, August 2004, pp. 1777–804.

<sup>7</sup> I. Erel, Y. Jang, and M. S. Weisbach, "Financing-Motivated Acquisitions," NBER Working Paper No. 17867, February 2012.

<sup>8</sup> U. Axelson, P. Stromberg, and M. S. Weisbach, "Why Are Buyouts Levered? The Financial Structure of Private Equity Firms," NBER Working Paper No. 12826, January 2007, and Journal of Finance, 64, August 2009, pp. 1549–82.

<sup>9</sup> U. Axelson, P. Stromberg, and M. S. Weisbach, "Borrow Cheap, Buy High? The Determinants of Pricing and Leverage in Buyouts," NBER Working Paper No. 15952, April 2010.

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## NBER Profile: Gita Gopinath

Gita Gopinath is a Research Associate in the NBER's Programs on Economic Fluctuations and Growth, Monetary Economics, and International Finance and Macroeconomics. She also is also a Professor of Economics at Harvard University.

Gopinath received her Ph.D. in economics from Princeton University in 2001. She taught at the University of Chicago's Booth School of Business from 2001–5 before coming to Harvard.

Gopinath currently serves on the

Board of Editors of the *American Economic Review* and is Associate Editor of the *Journal of International Economics*. She has been a Visiting Scholar in the Research Department of the Federal Reserve Bank of Boston since 2009. In 2011, she was named a Young Global Leader by the World Economic Forum.

Gopinath lives in Weston, MA with her husband and 9-year old son. Her hobbies are reading and watching films.



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## NBER Profile: *Daniel S. Hamermesh*

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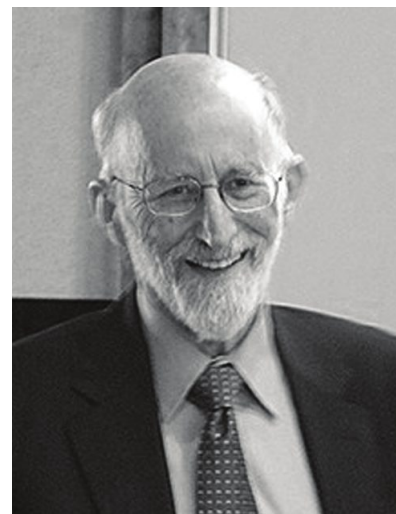
Daniel S. Hamermesh is a Research Associate in the NBER's Program on Labor Studies. He is also Sue Killam Professor in the Foundations of Economics at the University of Texas at Austin and professor of labour economics at Maastricht University, the Netherlands. (The Killam Professorship recognizes his teaching of introductory economics to over 20,000 students during his career, not his contributions to economic theory.)

Hamermesh received his A.B. from the University of Chicago in 1965 and his Ph.D. from Yale in 1969. He taught at Princeton and Michigan State University before moving to Texas in 1993. His research has focused on a number of areas, including issues of labor demand, time use, and some more unusual topics including

economic analyses of suicide, sleep, and the role of personal beauty in markets. In 2011, Princeton University Press published his *Beauty Pays*, which received substantial media attention.

Hamermesh is a Fellow of the Econometric Society and Past President of the Society of Labor Economists and the Midwest Economics Association. He has lectured at universities in 32 foreign countries and 47 states, which has jointly indulged his desires for talking about economics and for travel.

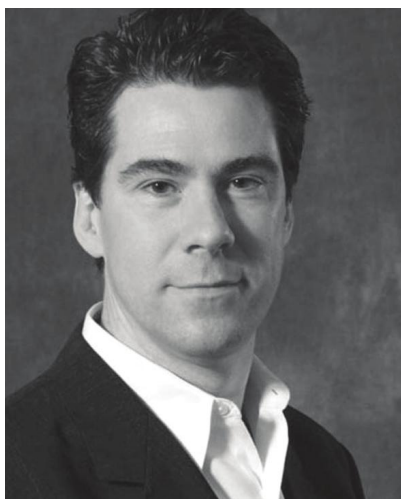
Hamermesh has been married for 45 years to Frances, a health-law attorney. They have two nearly-middle-aged sons and six grandchildren who range in age from 16 to 6.



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## NBER Profile: *Jonathan A. Parker*

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Jonathan A. Parker is a Research Associate in the NBER's Programs on Monetary Economics, Economic Fluctuations and Growth, and Asset Pricing. He also holds the Donald C. Clark/HSBC Chaired Professorship in Consumer Finance at the Kellogg School of Management at Northwestern University, where he teaches macroeconomics and finance.

Parker received his Ph.D. in economics in 1996 from MIT, where he was awarded the Robert Solow Endowment Prize for excellence in research and teaching. Prior to his present position at Northwestern, he held faculty positions at Princeton University, the University of Wisconsin, and at the

University of Michigan's Business School. Parker currently serves on the Academic Advisory Panel of the Federal Reserve Bank of Chicago, the Board of Editors of the *American Economic Review*, and the American Economic Association's Committee on Economic Statistics. He is also co-editor of the NBER's *Macroeconomics Annual*. During 2009, he worked as a Special Adviser for the Office of Financial Stability in the U.S. Department of the Treasury.

Parker lives with his wife and two boys in Evanston, IL, where he enjoys the solitude of running and biking and the family interaction of board games and basement soccer.



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## NBER Profile: *Michael S. Weisbach*

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Michael S. Weisbach is a Research Associate in the NBER's Corporate Finance Program. He is also the Ralph W. Kurtz Chair of Finance at Ohio State University. Weisbach received a B.S. in mathematics from the University of Michigan and a Ph.D. in economics from MIT. He previously taught at the University of Rochester, the University of Arizona, the University of Illinois, and the University of Chicago.

His early work was on the role of boards of directors in corporate governance. His more recent research has studied corporate

financial policy and private equity. In 2009, his paper "Why are Buyouts Leveraged? The Financial Structure of Private Equity Firms" (with Axelson and Stromberg) won the *Journal of Finance* Brattle Group Prize. Weisbach is also an editor of the *Review of Financial Studies* and a director of the American Finance Association.

Weisbach grew up in Cherry Hill, New Jersey. He and his wife, Amy, live in Bexley, Ohio. Their three children — Richard (20), Beth (18), and Jonathan (11) — keep them very busy.



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## Conferences

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### Innovation Policy and the Economy

The NBER's thirteenth annual Conference on Innovation Policy and the Economy took place in Washington on April 17. The conference was organized by NBER Research Associates Josh Lerner of Harvard University and Scott Stern of Northwestern University. The following papers were discussed:

- **Pierre Azoulay**, MIT and NBER; **Joshua S. Graff Zivin**, University of California, San Diego and NBER; and **Gustavo Manso**, University of California, Berkeley, "NIH Peer Review: Problems and Avenues for Reform"
- **Fiona Murray**, MIT Sloan School of Management, "Evaluating the Role of Science Philanthropy in American Research Universities"
- **Josh Lerner**, "The Boulevard of Broken Dreams: Innovation Policy and Entrepreneurship"
- **Mark A. Lemley**, Stanford Law School, "Fixing the Patent Office"
- **Jeffrey L. Furman**, Boston University and NBER, "The Economics of the America COMPETES Acts"

Summaries of these papers may be found at: <http://www.nber.org/confer/2012/IPes12/summary.html>

### Twenty-seventh Annual Conference on Macroeconomics

The NBER's Twenty-seventh Annual Conference on Macroeconomics, organized by Research Associates Daron Acemoglu of MIT, Jonathan Parker of Northwestern University, and Michael Woodford of Columbia University, took place in Cambridge on April 20 and 21. These papers were discussed:

- **Tobias Adrian**, Federal Reserve Bank of New York; **Paolo Colla**, Universita Bocconi; and **Hyun Song Shin**, Princeton University and NBER, "Which Financial Frictions? Parsing the Evidence from the Financial Crisis of 2007–9"



- **Timothy J. Besley**, London School of Economics; **Neil Meads**, Bank of England; and **Paolo Surico**, London Business School, “Risk Heterogeneity and Credit Supply: Evidence from the Mortgage Market”
- **Raj Chetty**, Harvard University and NBER, **Adam Guren**, Harvard University; **Day Manoli**, University of California at Los Angeles and NBER; and **Andrea Weber**, University of Mannheim, “Does Indivisible Labor Explain The Difference Between Micro And Macro Elasticities? A Meta-Analysis of Extensive Margin Elasticities” (NBER Working Paper No. 16729)
- **Sylvain Leduc** and **Daniel Wilson**, Federal Reserve Bank of San Francisco, “Roads to Prosperity or Bridges to Nowhere? Theory and Evidence on the Impact of Public Infrastructure Investment”
- **Etienne Gagnon** and **David Lopez-Salido**, Federal Reserve Board, and **Nicolas Vincent**, HEC Montreal, “Individual Price Adjustment along the Extensive Margin”
- **Mark Bills**, University of Rochester and NBER; **Peter J. Klenow**, Stanford University and NBER; and **Benjamin Malin**, Federal Reserve Board, “Testing for Keynesian Labor Demand”

Summaries of these papers may be found at: <http://www.nber.org/confer/2012/Macro12/summary.html>

## Universities-Research Conference on Insurance Markets and Catastrophe Risk

The NBER held a Universities Research Conference in Cambridge on “Insurance Markets and Catastrophe Risk” on May 11 and 12, 2012. NBER Research Associates Kenneth Froot of Harvard Business School and Howard Kunreuther of the University of Pennsylvania’s Wharton School, and Erwann Michel-Kerjan, also of the Wharton School, organized the conference and chose these papers for discussion:

- **Dwight Jaffee**, University of California at Berkeley, and **Thomas Russell**, Santa Clara University, “The Welfare Economics of Catastrophic Loss”
- **Antony Millner**, University of California at Berkeley, “On Welfare Frameworks and Catastrophic Climate Risks”
- **Emek Basker**, University of Missouri, and **Javier Miranda**, Bureau of the Census, “Taken by Storm: Business Survival in the Aftermath of Hurricane Katrina”
- **Tatyana Deryugina**, University of Illinois at Urbana-Champaign, “The Role of Transfer Payments in Mitigating Shocks: Evidence from the Impact of Hurricanes”
- **Jing Cai**, University of California, Berkeley, “Social Networks and the Decision to Insure: Evidence from Randomized Experiments in China”
- **Shawn A. Cole**, Harvard University; **Xavier Gine**, The World Bank; and **James Vickery**, Federal Reserve Bank of New York, “How Does Risk Management Influence Production Decisions? Evidence from a Field Experiment”
- **Raghav Gaiha**, University of Delhi; **Kenneth Hill**, Harvard University; and **Ganesh Thapa**, International Fund for Agricultural Development “Have Natural Disasters Become Deadlier?”
- **Enrico Biffis**, Imperial College Business School, and **Pietro Millosovich**, Cass Business School, “Optimal Insurance with Counterparty Default Risk”
- **Bartosz Mackowiak**, European Central Bank, and **Mirko Wiederholt**, Northwestern University, “Inattention to Rare Events”

- **Barry Goodwin**, North Carolina State University, “Copula-Based Models of Systemic Risk in U.S. Agriculture: Implications for Crop Insurance and Reinsurance Contracts”
- **Charles Huyck**, ImageCat, Inc., and **Adam Rose**, University of Southern California, “Improving Catastrophe Modeling for Business Interruption Insurance Needs”
- **S. Erik Oppers**, **Ken Chikada**, **Patrick A. Imam**, and **John Kiff**, International Monetary Fund, and **Michael Kisser**, Norwegian School of Economics, “The Financial Impact of Longevity Risk”
- **Thomas R. Berry-Stoelzle**, University of Georgia; **Greg Nini**, University of Pennsylvania; and **Sabine Wende**, University of Cologne, “External Financing in the Life Insurance Industry: Evidence from the Financial Crisis”

Summaries of these papers may be found at: <http://www.nber.org/confer/2012/URCs12/summary.html>

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## NBER News

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### Finkelstein Receives John Bates Clark Medal

NBER Research Associate Amy Finkelstein received the American Economics Association’s John Bates Clark Medal for 2012. This annual award recognizes the American economist under the age of 40 who has made the most substantial contribution to economic thought and knowledge. This year’s prize highlights Finkelstein’s research contributions on insurance markets, particularly her work on asymmetric information in the markets for health insurance, annuities, and long-term care insurance. It calls attention to her analysis of the welfare implications of insurance market imperfections, and to her investigations of how

public policies affect insurance market outcomes.

Finkelstein is a Professor of Economics at MIT and one of the co-directors of the NBER’s Public Economics Program. She is also a member of the Aging, Health Care, and Industrial Organization Programs. She received her B.A. in government from Harvard University in 1995, an M. Phil. in Economics from Oxford University in 1997, and a Ph.D. in Economics from MIT in 2001. She was appointed a Faculty Research Fellow at the NBER in 2001 and was promoted to Research Associate in 2007.

Other current NBER Research

Associates who have received the Clark Medal include Daniel McFadden, Martin S. Feldstein, Joseph E. Stiglitz, James J. Heckman, Jerry A. Hausman, Sanford J. Grossman, Paul R. Krugman, Lawrence H. Summers, David Card, Kevin M. Murphy, Andrei Shleifer, Steven Levitt, Daron Acemoglu, Susan C. Athey, Emmanuel Saez, Esther Duflo, and Jonathan Levin. Gary Becker, who was an NBER affiliate from 1957 until 1979, also won the Clark Medal, as did the late Milton Friedman and Zvi Griliches, both of whom were NBER affiliates for substantial parts of their careers.

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## Program and Working Group Meetings

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### Health Care Program Meeting

The NBER’s Program on Health Care met in Cambridge on March 8 and 9, 2012. Program Director Jonathan Gruber, NBER and MIT, organized the meeting. These papers were discussed:

- **Charles J. Courtemanche**, University of Louisville and NBER, and **Daniela Zapata**, University of North Carolina at Greensboro, “Does Universal Coverage Improve Health? The Massachusetts Experience” (NBER Working Paper No. 17893)

- **Subramaniam Ramanarayanan** and **Jason Snyder**, University of California at Los Angeles, “Reputations and Firm Performance: Evidence from the Dialysis Industry”
- **Amanda Starc**, University of Pennsylvania, “Insurer Pricing and Consumer Welfare: Evidence from Medigap”
- **Vivian Y. Wu**, University of Southern California, and **Yu-Chu Shen**, Naval Postgraduate School and NBER, “The Long-term Impact of Medicare Payment Reductions on Patient Outcomes” (NBER Working Paper No. 16859)
- **Jason Abaluck**, MIT, and **Jonathan Gruber**, MIT and NBER, “Dynamics of Plan Choice in Medicare Part D”

Summaries of these papers are available at: <http://www.nber.org/confer/2012/EEEHC12/summary.html>

## Environmental and Energy Economics

The NBER's Program on Environmental and Energy Economics met in Cambridge on March 9 and 10, 2012. Program Director Don Fullerton and Faculty Research Fellow Nolan H. Miller, both of NBER and the University of Illinois, organized the meeting. These papers were discussed:

- **Garth Heutel**, University of North Carolina, Greensboro and NBER, and **Christopher J. Ruhm**, University of Virginia and NBER, “Air Pollution and Pro-cyclical Mortality”
- **Jesse K. Antilla-Hughes**, Columbia University, and **Solomon M. Hsiang**, Princeton University, “Destruction, Disinvestment, and Death: Economic and Human Losses Following Environmental Disaster”
- **Ester Duflo** and **Michael Greenstone**, MIT and NBER, and **Rema Hanna**, Harvard University, “Up in Smoke: The Long-Run Impact of Improved Cooking Stoves” (NBER Working Paper No. 18033)
- **Christopher R. Knittel**, MIT and NBER, and **Ryan Sandler**, University of California at Davis, “Cleaning the Bathwater with the Baby: The Health Co-Benefits of Carbon Pricing in Transportation” (NBER Working Paper No. 17390)
- **Prashant Bharadwaj** and **Joshua S. Graff Zivin**, University of California, San Diego, and **Christopher Neilson**, Yale University, “Temperature and Human Capital Formation”
- **Hunt Allcott**, New York University and NBER; **Sendhil Mullainathan**, Harvard University and NBER; and **Dmitry Taubinsky**, Harvard University, “Externalities, Internalities, and the Targeting of Energy Policy”
- **Harrison Fell**, Resources for the Future; **Ian Mackenzie**, ETH Zürich; and **William A. Pizer**, Duke University and NBER, “Prices versus Quantities versus Bankable Quantities” (NBER Working Paper No. 17878)

Summaries of these papers are available at: <http://www.nber.org/confer/2012/EEEHC12/summaryEEE.html>

## Productivity, Innovation, and Entrepreneurship Meeting

The NBER's Program on Productivity, Innovation, and Entrepreneurship, directed by NBER Research Associates Nick Bloom of Stanford University and Josh Lerner of the Harvard Business School, met in Cambridge on March 16, 2012. These papers were discussed:

- **Erik Brynjolfsson**, MIT and NBER, and **Heekyoung H. Kim**, “CEO Pay and Information Technology”
- **Ajay K. Agrawal**, University of Toronto and NBER; **Iain M. Cockburn**, Boston University and NBER; **Alberto Galasso**, University of Toronto; and **Alexander Oettl**, Georgia Institute of Technology, “Why Are Some Regions More Innovative Than Others? The Role of Firm Size Diversity”
- **Ufuk Akcigit**, University of Pennsylvania and NBER, and **William R. Kerr**, Harvard University and NBER, “Growth through Heterogeneous Innovations”

- **Leonid Kogan**, MIT and NBER; **Dimitris Papanikolaou**, Northwestern University; **Amit Seru**, University of Chicago and NBER; and **Noah Stoffman**, Indiana University, “Technological Innovation, Resource Allocation, and Growth”
- **Serguey Braguinsky**, Carnegie Mellon University; **Sergey V. Mityakov**, Clemson University; and **Andrei Liskovich**, John F. Kennedy School of Government, “Direct Estimation of Hidden Earnings: Evidence from Administrative Data”
- **Fabian Waldinger**, University of Warwick, “Bombs, Brains, and Science — The Role of Human and Physical Capital for the Creation of Scientific Knowledge”

Summaries of these papers may be found at: <http://www.nber.org/confer/2012/PRs12/summary.html>

## International Trade and Investment

The NBER’s Program on International Trade and Investment met at the Federal Reserve Bank of New York on March 23 and 24, 2012. NBER Research Associate Stephen J. Redding of Princeton University organized the meeting. These papers were discussed:

- **Runjuan Liu**, University of Alberta, and **Daniel Trefler**, University of Toronto and NBER, “A Sorted Table of Globalization: White Collar Jobs and the Rise of Service Offshoring” (NBER Working Paper No. 17559)
- **Kalina Manova**, Stanford University and NBER, and **Zhiwei Zhang**, Hong Kong Monetary Authority, “Multi-Product Firms and Product Quality”
- **Robert C. Johnson**, Dartmouth College, and **Guillermo Noguera**, Columbia University, “Fragmentation and Trade in Value Added over Four Decades”
- **Bruce Blonigen**, University of Oregon and NBER; **Lionel Fontagne** and **Farid Toubal**, Paris School of Economics; and **Nicholas Sly**, University of Oregon, “Cherries for Sale: The Incidence of Cross-Border M&A”
- **Natalia Ramondo**, Arizona State University; **Veronica Rappoport**, Columbia University; and **Kim J. Ruhl**, New York University, “Horizontal vs. Vertical FDI: Revisiting Evidence from U.S. Multinationals”
- **Fernando Leibovici** and **Michael Waugh**, New York University, “International Trade and Intertemporal Substitution”
- **Andrew B. Bernard**, Dartmouth College and NBER; **Emily J. Blanchard**, Dartmouth College; **Ilke Van Beveren**, Lessius University College; and **Hylke Y. Vandenbussche**, CORE, Université Catholique de Louvain, “Carry-Along Trade”
- **Doireann Fitzgerald**, Stanford University, and **Stefanie Haller**, ESRI, “Exporters and Shocks”

Summaries of these papers may be found at: [www.nber.org/confer/2012/ITIs12/summary.html](http://www.nber.org/confer/2012/ITIs12/summary.html)

## Public Economics

The NBER’s Program on Public Economics met in Cambridge on March 29 and 30, 2012. Program Director Amy Finkelstein of MIT and NBER Research Associate Karl Scholz the University of Wisconsin organized the meeting. These papers were discussed:

- **Henrik Kleven** and **Mazhar Waseem**, London School of Economics, “Behavioral Responses to Notches: Evidence from Pakistani Tax Records”
- **Liran Einav** and **Jonathan D. Levin**, Stanford University and NBER; **Dan Knoepfle**, Stanford University; and **Neel Sundaresan**, eBay Research Labs, “Sales Taxes and Internet Commerce”
- **Justine S. Hastings**, Brown University and NBER, and **Ali Hortacsu** and **Chad Syverson**, University of Chicago and NBER, “Advertising and Competition in Privatized Social Security: The Case of Mexico”
- **Jonathan T. Kolstad**, University of Pennsylvania and NBER, and **Amanda E. Kowalski**, Yale University and NBER, “Mandate-Based Health Reform and the Labor Market: Evidence from the Massachusetts Reform” (NBER Working Paper No. 17933)



- **Aviva Aron-Dine**, MIT; **Liran Einav**; **Amy Finkelstein**; and **Mark R. Cullen**, Stanford University and NBER, “Moral Hazard in Health Insurance: How Important is Forward Looking Behavior?” (NBER Working Paper No. 17802)
- **David Albouy**, University of Michigan and NBER, “Metropolitan Land Values and Housing Productivity”

Summaries of these papers may be found at: <http://www.nber.org/confer/2012/PEs12/summary.html>

## Asset Pricing Program Meeting

The NBER’s Program on Asset Pricing met at the University of Chicago’s Booth School of Business on April 13, 2012. Jakub W. Jurek and Wei Xiong, both of NBER and Princeton University, organized the meeting and chose these papers to discuss:

- **Leonid Kogan**, MIT and NBER; **Dimitris Papanikolaou**, Northwestern University; **Amit Seru**, University of Chicago and NBER; and **Noah Stoffman**, Indiana University, “Technological Innovation, Resource Allocation, and Growth” (NBER Working Paper No. 17769)
- **Howard Kung** and **Lukas Schmid**, Duke University, “Innovation, Growth, and Asset Prices”
- **John Y. Campbell**, Harvard University and NBER; **Stefano Giglio**, University of Chicago; **Christopher Polk**, London School of Economics; and **Robert Turley**, Harvard University, “An Intertemporal CAPM with Stochastic Volatility”
- **Ravi Bansal**, Duke University and NBER; **Dana Kiku** and **Ivan Shaliastovich**, University of Pennsylvania; and **Amir Yaron**, University of Pennsylvania and NBER, “Volatility, the Macroeconomy, and Asset Prices”
- **Andrea Frazzini**, AQR Capital Management, and **Lasse H. Pedersen**, New York University and NBER, “Embedded Leverage”
- **Ji Shen**, London School of Economics, and **Hongjun Yan** and **Jinfan Zhang**, Yale University, “Collateral-Motivated Financial Innovation”
- **Hanno Lustig**, University of California, Los Angeles and NBER; **Nikolai Roussanov**, University of Pennsylvania and NBER; and **Adrien Verdelhan**, MIT and NBER, “Countercyclical Currency Risk Premia” (NBER Working Paper No. 16427)

Summaries of these papers may be found at: <http://www.nber.org/confer/2012/APs12/summary.html>

## Cohort Studies Meeting

The NBER’s Working Group on Cohort Studies, directed by Dora Costa of the University of California, Los Angeles, met in Cambridge on April 13–14, 2012. These topics were discussed:

- **J. Michael Gaziano**, VA Boston Healthcare System and Brigham and Women’s Hospital, “Million Veteran Program: A 21st Century Mega Cohort within a Health System”
- **Frank R. Lichtenberg**, Columbia University and NBER, “The Effect of Pharmaceutical Innovation on Longevity: Patient-Level Evidence from the 1996–2002 Medical Expenditure Panel Survey and Linked Mortality Public-Use Files”
- **Steven Lehrer**, Queen’s University and NBER; **Nicholas Christakis**, Harvard University; and **James Rosenquist**, Massachusetts General Hospital, “The Importance of Genetic Modification of Birth Cohort Environments on Risky Behavior: Evidence from the Framingham Heart Study”
- **Costas Meghir**, Yale University; **Mårten Palme**, Stockholm School of Economics; and **Emilia Simeonova**, Princeton University and NBER, “Education, Health and Mortality: Evidence from a Social Experiment” (NBER Working Paper No. 17932)
- **Chulhee Lee**, Seoul National University, “In-Utero Exposure to the Korean War and Its Long-Term Effects on Economic and Health Outcomes”

- **Martha J. Bailey**, University of Michigan and NBER, and **Andrew Goodman-Bacon**, University of Michigan, “The War on Poverty’s Experiment in Public Medicine: Community Health Centers and the Mortality of Older Americans”
- **Stefania Albanesi**, Columbia University and NBER, “Maternal Health and Fertility: An International Perspective”
- **Richard Hornbeck**, Harvard University and NBER, and **Suresh Naidu**, Columbia University and NBER, “When the Levee Breaks: Labor Mobility and Economic Development in the American South”
- **Evan Roberts**, University of Minnesota, and **Pamela Wood**, Monash University, “Birth weight and Adult Health in Historical Perspective: Evidence from a New Zealand Cohort, 1907–1922”

Summaries of these papers may be found at: <http://www.nber.org/confer/2012/CS12/summary.html>

## Corporate Finance

The NBER’s Program on Corporate Finance met at the University of Chicago’s Booth School of Business on April 13, 2012. NBER Research Associates Yael Hochberg, NBER and Northwestern University’s Kellogg School of Management, and Alexander Ljungqvist, NBER and NYU’s Stern School of Business, organized the meeting. These papers were discussed:

- **John Hund**, Rice University; **Donald R. Monk**, Rutgers University; and **Sheri T. Tice**, Tulane University, “Apples to Apples: The Economic Benefits to Diversification”
- **Geoffrey Tate** and **Liu Yang**, University of California at Los Angeles, “The Bright Side of Corporate Diversification: Evidence from Internal Labor Markets”
- **Zhiguo He**, University of Chicago, and **Gregor Matvos**, University of Chicago and NBER, “Debt and Creative Destruction: Why Could Subsidizing Corporate Debt be Optimal?” (NBER Working Paper No. 17920)
- **Dirk Hackbarth**, University of Illinois at Urbana-Champaign; **Richmond D. Mathews**, University of Maryland; and **David T. Robinson**, Duke University and NBER, “Capital Structure, Product Market Dynamics, and the Boundaries of the Firm”
- **Casey Dougal**, University of North Carolina; **Christopher A. Parsons**, University of California, San Diego; and **Sheridan Titman**, University of Texas, Austin and NBER, “Urban Vibrancy and Corporate Growth”
- **Moqi Xu**, London School of Economics, “The Costs and Benefits of Long-term CEO Contracts”
- **Erik P. Gilje** and **Jerome P. Taillard**, Boston College, “Do Public Firms Invest Differently than Private Firms? Taking Cues from the Natural Gas Industry”

Summaries of these papers may be found at: <http://www.nber.org/confer/2012/CFs12/summary.html>

## Behavioral Finance/Housing Bubbles

The Behavioral Economics Working Group held a meeting on Behavioral Finance/Housing Bubbles at the University of Chicago’s Booth School on April 14, 2012. NBER Research Associates Christopher J. Mayer of Columbia University, Jose Scheinkman of Princeton University, and Robert Shiller of Yale University organized the meeting and chose these papers to discuss:

- **Fernando Ferreira** and **Joseph Gyourko**, University of Pennsylvania and NBER, “Anatomy of the Beginning of the Housing Boom: U.S. Neighborhoods and Metropolitan Areas, 1993–2009”
- **Alex M. Chincó**, New York University’s Stern School of Business, and **Christopher J. Mayer**, “Distant Speculators and Asset Bubbles in the Housing Market”
- **Ing-Haw Cheng** and **Sahil Raina**, University of Michigan, and **Wei Xiong**, Princeton University and NBER, “Wall Street and the Housing Bubble: Bad Incentives, Bad Models, or Bad Luck?”

- **Sumit Agarwal**, Federal Reserve Bank of Chicago, and **Itzhak Ben-David**, Ohio State University, “Do Loan Officers’ Incentives Lead to Lax Lending Standards?”
- **Elena Loutschina**, University of Virginia, and **Philip Strahan**, Boston College and NBER, “Financial Integration, Housing and Economic Volatility”

These summaries may be found at: <http://www.nber.org/confer/2012/BEs12/summary.html>

## DAE Program Meeting

The NBER’s Program on the Development of the American Economy, directed by Claudia Goldin of Harvard University, met in Cambridge on April 14, 2012. These papers were discussed:

- **Elizabeth U. Cascio**, Dartmouth College and NBER, and **Ebonya L. Washington**, Yale University and NBER, “Valuing the Vote: The Redistribution of Voting Rights and State Funds Following the Voting Rights Act of 1965” (NBER Working Paper No. 17776)
- **Dave Donaldson**, MIT and NBER, and **Richard Hornbeck**, Harvard University and NBER, “Railroads and American Economic Growth: A ‘Market Access’ Approach”
- **Tomas Cvrcek**, Clemson University and NBER, and **Nicholas Laurence**, Clemson University, “The Spread of Steam Power: How Neighbors Mattered, 1841–1863”

Summaries of these papers are available at: <http://www.nber.org/confer/2012/DAEs12/summary.html>

## Health Economics Program Meeting

The NBER’s Program on Health Economics met in Cambridge on April 20, 2012. Program Director Michael Grossman of City University of New York’s Graduate Center and Research Associate Theodore J. Joyce of Baruch College organized the meeting. These papers were discussed:

- **D. Mark Anderson**, Montana State University; **Daniel I. Rees**, University of Colorado, Denver; and **Benjamin Hansen**, University of Oregon, “Medical Marijuana Laws, Traffic Fatalities, and Alcohol Consumption”
- **Tinna Laufey Asgeirsdottir** and **Porhildur Olafsdottir**, University of Iceland; **Hope Corman** and **Kelly Noonan**, Rider University and NBER; and **Nancy E. Reichman**, University of Medicine and Dentistry of New Jersey, “Are Recessions Good for Your Health Behaviors? Impacts of the Financial Crisis in Iceland”
- **John Cawley**, Cornell University and NBER; **David Frisvold**, Emory University; and **Chad Meyerhoefer**, Lehigh University, “The Impact of Physical Education on Obesity among Elementary School Children”
- **Charles J. Courtemanche**, University of Louisville and NBER; **Garth Heutel**, University of North Carolina, Greensboro and NBER; and **Patrick McAlvanah**, Federal Trade Commission, “Impatience, Incentives, and Obesity” (NBER Working Paper No. 17483)
- **Geoffrey Joyce** and **Dana Goldman**, University of Southern California and NBER, and **Julie Zissimopoulos**, University of Southern California, “Digesting the Doughnut Hole”
- **Daniel Millimet**, Southern Methodist University, and **Rusty Tchernis**, Georgia State University and NBER, “Estimation of Treatment Effects without an Exclusion Restriction: with an Application to the Analysis of the School Breakfast Program” (NBER Working Paper No. 15539)

Summaries of these papers may be available at: <http://www.nber.org/confer/2012/HES12/summary.html>

## Political Economy

The NBER's Program on Political Economy, directed by Alberto Alesina of Harvard University, met in Cambridge on April 27, 2012. These papers were discussed:

- **Sumit Agarwal**, Federal Reserve Bank of Chicago; **David Lucca**, Federal Reserve Bank of New York; **Amit Seru**, University of Chicago and NBER; and **Francesco Trebbi**, University of British Columbia and NBER, "Inconsistent Regulators: Evidence From Banking" (NBER Working Paper No. 17736)
- **Erik Snowberg**, California Institute of Technology and NBER, and **Pietro Ortoleva**, California Institute of Technology, "Confidence and Overconfidence in Political Economy"
- **Mathieu Couttenier**, Paris School of Economics, and **Marc Sangnier**, Sciences Po, "Living in the Garden of Eden: Mineral Resources Foster Individualism"
- **Francesco Caselli**, London School of Economics and NBER; **Massimo Morelli**, Columbia University; and **Dominic Rohner**, University of Zurich, "The Geography of Inter-State Resource Wars"
- **Nicola Gennaioli**, CREI, and **Joachim Voth**, CREI, Barcelona, "State Capacity and Military Conflict"
- **Abhijit Banerjee** and **Esther Duflo**, MIT and NBER; **Daniel Keniston**, Yale University; **Raghavendra Chattopadhyay**, IIM Calcutta; and **Nina Singh**, Rajasthan Police, "Can Institutions be Reformed from Within? Evidence from a Randomized Experiment with the Rajasthan Police"

Summaries of these papers may be found at: <http://www.nber.org/confer/2012/POLs12/summary.html>

## Children's Program Meeting

The NBER's Program on Children, directed by Janet Currie of University of California, Los Angeles, met in Cambridge on May 10, 2012. The following papers were discussed:

- **Elizabeth Ananat**, Duke University and NBER, and **Anna Gassman-Pines**, **Dania V. Francis**, and **Christina M. Gibson-Davis**, Duke University, "Children Left Behind: The Effects of Statewide Job Loss on Student Achievement" (NBER Working Paper No. 17104)
- **Maya Rossin-Slater**, Columbia University, "Engaging Absent Fathers: Lessons from Paternity Establishment Programs"
- **Jorge Agüero** and **Deolalikar Anil**, University of California, Riverside, "Late Bloomers? Identifying Critical Periods in Human Capital Accumulation — Evidence from the Rwanda Genocide"
- **Achyuta Adhvaryu** and **Anant Nyshadham**, Yale University, "Endowments and Investments within the Household: Evidence from Iodine Supplementation in Tanzania"
- **Emla Fitzsimons**, Institute for Fiscal Studies, and **Marcos Vera-Hernández**, University College London, "Breastfeeding and Children's Development"
- **Sara Borelli**, IMPAQ International, and **Robert Kaestner**, University of Illinois and NBER, "Long Term Effects of Abortion Parental Involvement Laws"

Summaries of these papers may be found at: <http://www.nber.org/confer/2012/CHEDs12/summary.html>



## Education Program Meets

The NBER's Program on Education, directed by Caroline M. Hoxby of Stanford University, met in Cambridge on May 11, 2012. The following papers were discussed:

- **Kalena Cortes**, Texas A&M University; **Joshua Goodman**, Harvard University; and **Takako Nomi**, University of Chicago, "Doubling Up: The Long Run Impacts of Remedial Algebra on High School Graduation and College Enrollment"
- **Lesley Turner**, Columbia University, "The Incidence of Student Financial Aid: Evidence from the Pell Grant Program"
- **Brian Jacob**, University of Michigan and NBER, and **Brian McCall** and **Kevin M. Stange**, University of Michigan, "The Consumption Value of Postsecondary Education"
- **David Deming**, University of North Carolina at Charlotte; **Steve Billings**, Harvard University; and **Jonah E. Rockoff**, Columbia University and NBER, "School Segregation Educational Attainment and Crime: Evidence from the End of Busing in Charlotte-Mecklenburg"
- **Matthew Wiswall**, New York University, and **Basit Zafar**, Federal Reserve Bank of New York, "Determinants of College Major Choice: Identification using an Information Experiment"
- **Dan Goldhaber**, University of Washington, and **Duncan Chaplin**, Mathematica Policy Research, "Assessing the 'Rothstein Test' Does It Really Show Teacher Value-Added Models Are Biased?"

Summaries of these papers may be found at: <http://www.nber.org/confer/2012/CHEDs12/edsummary.html>

## Organizational Economics Meeting

The NBER's Working Group on Organizational Economics met in Cambridge on May 18 and 19, 2012. The program was organized by Working Group Director Robert S. Gibbons of MIT. The papers discussed were:

- **Canice Prendergast**, University of Chicago, "The Economics of Wild Goose Chases"
- **Eric Van den Steen**, Harvard University, "A Theory of Explicitly Formulated Strategy"
- **Marina Halac**, **Navin Kartik**, and **Qingmin Liu**, Columbia University, "Optimal Contracts for Experimentation"
- **Heski Bar-Isaac** and **Joyee Deb**, New York University, "Reputation for a Servant of Two Masters"
- **Rajkamal Iyer**, MIT, and **Antoinette Schoar**, MIT and NBER, "Ex Post (In)efficient Negotiation and the Breakdown of Trade"
- **Raghuram Rajan**, University of Chicago and NBER, "The Corporation in Finance"
- **Guido Friebel**, Université de Toulouse, and **Michael Raith**, University of Rochester, "Silo or Market: Internal Labor Markets in Multi-divisional Firms"
- **Birger Wernerfelt**, MIT, "The Equilibrium Organization of Labor"

- **Sylvain Chassang**, Princeton University, and **Christian Zehnder**, University of Lausanne, “A Theory of Informal Justice”
- **Supreet Kaur**, Harvard University, and **Michael Kremer** and **Sendhil Mullainathan**, Harvard University and NBER, “Self-Control at Work: Evidence from a Field Experiment”
- **Valerie Smeets** and **Frederic Warzynski**, Aarhus University, and **Michael Waldman**, Cornell University, “Performance, Career Dynamics, and Span of Control”
- **Camelia M. Kuhnen**, Northwestern University, and **Paul Oyer**, Stanford University and NBER, “Exploration for Human Capital: Theory and Evidence from the MBA Labor Market”

Summaries of these papers are available at: <http://www.nber.org/confer/2012/OEs12/summary.html>

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## NBER Books

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## Innovation Policy and the Economy, Volume 12

*Innovation Policy and the Economy, Volume 12*, edited by Josh Lerner and Scott Stern, is now available from the University of Chicago Press. The IPE conference series provides a forum for research on the interactions among public policy, the innovation process, and the economy. The distinguished contributors to these volumes look at policies that affect the ability of an economy to achieve scientific and technological progress, or that shape the impact of science and technology on economic growth. *Volume 12* includes an exploration

of recent events in the U.S. economy and their implications for innovation and growth; a consideration of the role of non-compete agreements in shaping labor market dynamics, the propensity for entrepreneurship, and regional migration; and an empirical analysis of the issues of rapid advance and increased centrality of digital networks and platforms, as well as the increasing attention on the role of individual privacy.

Josh Lerner is co-director of the NBER's Program on Productivity,

Innovation, and Entrepreneurship and the Jacob H. Schiff Professor of Investment Banking at Harvard Business School. Scott Stern directs the NBER's Working Group on Innovation Policy and is the School of Management Distinguished Professor and Chair of the Technological Innovation, Entrepreneurship, and Strategic Management Group at the MIT Sloan School of Management.

This volume is priced at \$75.00 for the cloth bound edition and \$25.00 for the paperback.

## NBER International Seminar on Macroeconomics 2011

The 2011 volume of *NBER International Seminar on Macroeconomics*, edited by Jeffrey A. Frankel and Christopher Pissarides, is available from the University of Chicago Press. This conference series brings together leading

American and European economists to discuss a broad range of current issues in global macroeconomics. ISoM has met annually in Europe for over 30 years.

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the international economy; a view of demand stimulus through the lens of the high level of unemployment that most advanced countries experienced in the recent global recession; and nominal and real exchange rates.

Frankel directs the NBER's Program of Research on International Finance and Macroeconomics and is the James W. Harpel Professor of Capital Formation and

Growth at Harvard University's Kennedy School. Pissarides, one of the 2010 winners of the Nobel Prize for Economics, is the Norman Sosnow Chair in Economics

at the London School of Economics.

This volume is priced at \$90.00 for the clothbound edition and \$50.00 for the paperback.

## NBER Macroeconomics Annual 2011, Volume 26

The twenty-sixth edition of the *NBER Macroeconomics Annual*, edited by Daron Acemoglu and Michael Woodford, is available from the University of Chicago Press. This annual conference series has a long tradition of featuring both theoretical and empirical contributions that shed light on central issues in contemporary macroeconomics. The papers prepared for these meetings push the frontiers of macroeconomic work in areas ranging from short-run macroeconomic fluctuations to

exchange rates, financial regulation, and political economy. This year's volume features several papers that aim to illuminate the causes of the recent financial crisis and consider policies that might reduce the likelihood of similar crises in the future. Topics include analyses of the sources of asset market bubbles and their macroeconomic consequences; the reconsideration of financial regulation and ways in which it could be improved; exchange-rate determination; and the macroeconomic determi-

nants of unemployment.

Acemoglu and Woodford are NBER Research Associates in the NBER's Program on Economic Fluctuations and Growth. Acemoglu is the Elizabeth and James Killian Professor of Economics at MIT. Woodford is the John Bates Clark Professor of Political Economy at Columbia University.

This volume is priced at \$90.00 for the clothbound edition and \$60.00 for the paperback.

## Tax Policy and the Economy, Volume 26

*Tax Policy and the Economy, Volume 26*, edited by Jeffrey R. Brown, will be available from the University of Chicago Press in summer 2012. This annual conference volume covers such topics as: how incentives built into Social Security affect labor supply and retirement decisions; what reforming

the tax preference for employer health insurance might accomplish; how corporate tax reform in the EU might affect U.S. investment in Europe; and, whether tax expenditures and the size and efficiency of government affect decisions about budget reform.

Brown is an NBER Research Associate

in the Programs on Aging and Public Economics. He is also the William G. Karnes Professor of Finance at the University of Illinois at Urbana-Champaign.

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Wise directs the NBER's Program on the Economics of Aging and is the John F. Stambaugh Professor of Political Economy Harvard University's Kennedy School.

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