NBER Reporter

NATIONAL BUREAU OF ECONOMIC RESEARCH

A quarterly summary of NBER research

No. 2, June 2019

Martin Feldstein, 1939–2019

Renowned Economist and NBER President Emeritus

Martin Feldstein, president of the NBER for nearly 30 years, George F. Baker Professor of Economics at Harvard University, chair of the President's Council of Economic Advisers from 1982 to 1984, and one of the most prolific and influential economists of the last half century, passed away on Tuesday, June 11. He was 79.

Obituary in NBER News, p. 31

ALSO IN THIS ISSUE

Program Report

Economic Fluctuations and Growth

Mark Gertler and Pete Klenow*

Over the last decade, research in the Economic Fluctuations and Growth (EFG) Program has responded to important macroeconomic challenges. This report emphasizes four areas in which there have been significant developments. First, the global financial crisis has prompted research on the sources and propagation of financial crises, as well as on policy responses. Second, the general decline in business dynamism and lackluster productivity have reignited interest in economic growth analysis. Third, the surge in income and wealth inequality has generated new work on macroeconomic determinants of inequality. Fourth, with respect to methodology, there has been a growing recognition that so-called "representative agent" models are not sufficient for addressing many key macroeconomic issues. This has led to the development and increased use of heterogeneous agent models. This report summarizes recent research in each of these areas.

1. The Great Recession, Financial Crises, and Policy Responses

Researchers affiliated with the EFG program have analyzed both the financial crisis and the policy responses extensively. Roughly one tenth of recent EFG working papers have been devoted to these issues.

Theoretical and empirical work on financial crises predates the Great Recession. This work emphasized the role of borrower balance sheets in constraining credit access when capital markets are imperfect. It then associated financial crises with a kind of "adverse feed-

**Mark Gertler, a professor of economics at New York University, and Pete Klenow, a professor of economics at Stanford University, co-direct the Economic Fluctuations and Growth Program.* *This report draws on extensive input from Roland Bénabou, Oded Galor, Erik Hurst, Greg Kaplan, Gianluca Violante, and Fabrizio Zilibotti.*

NBER Reporter

The NBER depends on funding from individuals, corporations, and private foundations to maintain its independence and its flexibility in choosing its research activities. Inquiries concerning contributions may be addressed to James M. Poterba, President & CEO, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138-5398. All contributions to the NBER are tax-deductible.

Requests for subscriptions, changes of address, and cancellations should be sent to *Reporter*, National Bureau of Economic Research, Inc., 1050 Massachusetts Avenue, Cambridge, MA 02138-5398 (please include the current mailing label), or by email to subs@nber.org. Print copies of the *Reporter* are only mailed to subscribers in the U.S. and Canada; those in other nations may request electronic subscriptions at www.nber.org/drsubscribe/.

back loop" in which declines in real activity weaken borrower balance sheets, which in turn further depress spending and real activity. The emphasis was on borrowing frictions faced by nonfinancial firms. However, the evidence from the recent crisis suggests that the key conduits of financial distress were mainly highly leveraged households and highly leveraged shadow banks. While nonfinancial firms eventually felt the brunt of the financial distress, it was a dramatic buildup of leverage in the housing and shadow banking sectors that made the economy vulnerable to financial collapse.

There is now a rough consensus that there were two main channels of financial distress. The first, which we call the "household balance sheet channel," features the impact of declining house prices on households' net financial positions, and in turn on their credit access and spending. The second, which we term "the banking distress channel," features the effect of weakening of bank balance sheets on credit intermediation.[1] Of course the two channels are interrelated, as the sources of the financial distress in banking stemmed from losses on mortgage-related securities that eventually led to a full-scale panic.

• *The Household Balance Sheet Channel*

Partly because of how the data was unfolding in real time during the crisis, much of the early research emphasis was on the household balance sheet channel. The origins of the crisis involved an extraordinary housing boom, featuring a dramatic run-up in home prices and mortgage debt. Among the factors triggering the boom were: a secular decline in mortgage rates due to a combination of declining long-term interest rates and innovation in mortgage finance, relaxation of lending standards, and widespread optimism about housing prices.

What we have learned to appreciate since is that the pre-crisis housing boom was not unique to the 2007 U.S. experience. Across both countries and time, it is typical for run-ups of both household debt and housing prices to precede major financial crises. For example, Òscar Jordà, Moritz Schularick, and Alan Taylor document that the run-up in household mortgage debt occurred across countries as a precursor to the recent global financial crisis.[2] Arvind Krishnamurthy and

Tyler Muir, in related work, find that not all household debt booms lead to crises, but that those accompanied by increasing credit spreads are more likely to do so.[3]

What initially triggers the crises that follow a run-up in household debt, including the recent one, is a contraction in house prices. According to the household balance sheet channel, the drop in house prices weakens the balance sheets of households highly leveraged with mortgage debt. In turn, there is a significant decline in household spending.

The descriptive evidence suggests that a household balance sheet channel was a key conduit of financial distress during the Great Recession. The left panel in Figure 1 shows the behavior of household debt to income (the blue line) versus debt to assets (the gray line) over the period 2004 to 2012. The right panel shows house prices (the blue line) and consumer durable consumption (the gray line). In each panel the shaded band is the recession and the solid vertical line is the date of the Lehman bankruptcy. Preceding the crisis there is a roughly 20 percent run-up of household debt as a percentage of income. The debt-to-assets ratio remains stable until 2007, reflecting that home prices increase along with debt. However, as home prices decline starting in early 2007, the household debt-to-assets ratio sharply increases. The weakening of household balance sheets, in turn, leads to a sharp drop in spending on consumer durables.

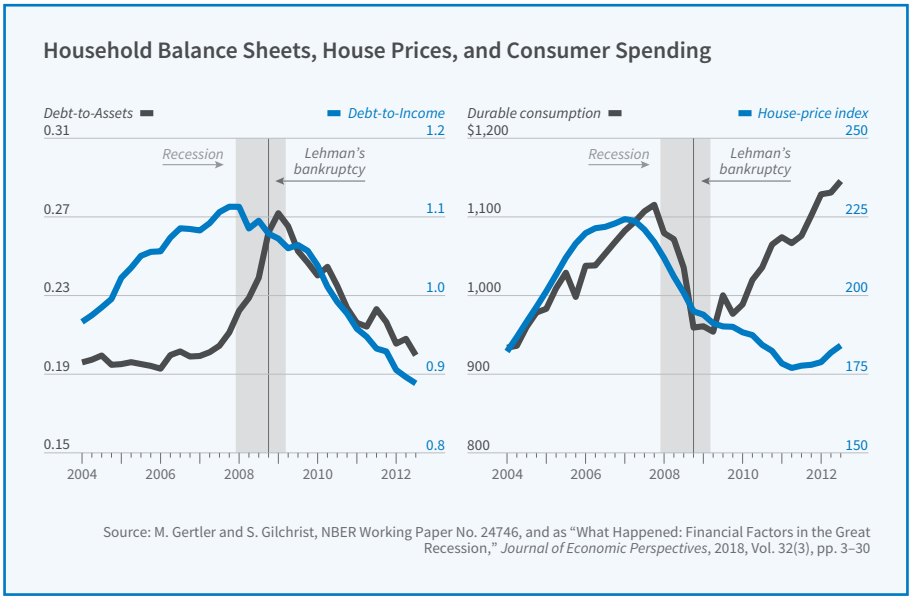


Figure 1

With aggregate data, however, it is difficult to identify causality. Aggregate housing prices could be responding to the decline in real activity, as opposed to influencing it. In a series of highly influential papers, Atif Mian and Amir Sufi use cross-sectional data to identify the household balance sheet channel.[4] They first show that regions which experienced the largest run up in home prices and mortgage debt in the years prior to the crisis suffered the largest drops in home prices and real activity once the crisis hit. For the crisis period, they estimate cross-sectional regressions that relate some measure of real activity—for example, consumption or non-tradable employment—to the decline in household net worth, where the latter is measured by the rate of decline in home prices weighted by household leverage at the beginning of the crisis. They identify exogenous variation in household net worth using an instrumental variable based on local land supply elasticity. Because the regression is cross-sectional and time effects are removed, it is not possible to identify the aggregate effects of the household balance sheet channel. Nonetheless, the results provide persuasive evidence of the existence of a household balance sheet channel.[5]

The empirical work on the household balance sheet in turn motivated a vast theoretical literature that modifies macroeconomic models to allow for balance sheet constraints on households. As with models developed before the crisis, these models feature adverse feedback loops between borrower balance sheets and real activity, but they put households, rather than non-financial firms, at center stage. One interesting auxiliary finding is that the tightening of balance sheet constraints on household borrowers not only reduces household spending, it also pushes down interest rates, helping account for how household financial distress could move the economy into a liquidity trap, where the zero lower bound on the nominal interest rate binds.[6]

• *Banking Distress and the Real Economy*

The mirror image of the sharp increase in household indebtedness portrayed in Figure 1 was a sharp increase in the leveraging of the banking system, particularly the shadow banking system that operated outside the direct regulatory control of the Federal Reserve. The right panel in Figure 2, on the next page, illustrates the behavior of the liabilities of broker/dealers—the investment banks that were the main actors in the shadow banking sector. The growth of the shadow banking sector financed the sharp increase in mortgage-related securities, a product of the housing boom described earlier. Importantly, while the assets held by these institutions were mainly long-term, the liabilities were mostly short-term. With the benefit of hindsight, this maturity mismatch made them vulnerable to panic. The downturn in house prices portrayed in Figure 1 not only weakened household balance sheets, it induced losses in mortgage-related securities held by both shadow and commercial banks. The highly lever-

aged and lightly regulated shadow banking sector was particularly vulnerable. The losses on mortgage-related securities led to panic in markets for wholesale short-term funding, culminating in the failure of Lehman Brothers and the investment banking collapse.[7] The collapse in broker/dealer liabilities portrayed in Figure 2 was the product of these events.

The role of the banking distress channel demonstrates that the weakening of bank balance sheets over the crisis induced a contraction in intermediation, raising the cost of credit and thus weakening real activity. As with the household balance sheet channel, the aggregate data provide some suggestive support. The left panel in Figure 2 plots GDP growth against a measure of financial distress, the excess bond premium (EBP) developed by Simon Gilchrist and Egon Zakrajšek.[8] The EBP measures the spread between the rate of return on corporate bonds and on similar maturity government bonds, but with the default premium removed. The latter adjustment implies that increases in the EBP reflect elevation in the cost of credit as opposed to signals of increasing default. As Figure 2 shows, the beginning of the recession features relatively modest declines in output growth and increases in the EBP. In the summer of 2008, the recession appeared similar to the relatively mild downturns of 1990–91 and 2001–02. However, as Figure 2 makes clear, closely correlated with the Lehman collapse is a sharp increase in the EBP along with a sharp contraction in GDP growth. This broad connection of banking disruption, rising credit costs, and declining real activity is highly suggestive of a banking distress channel.

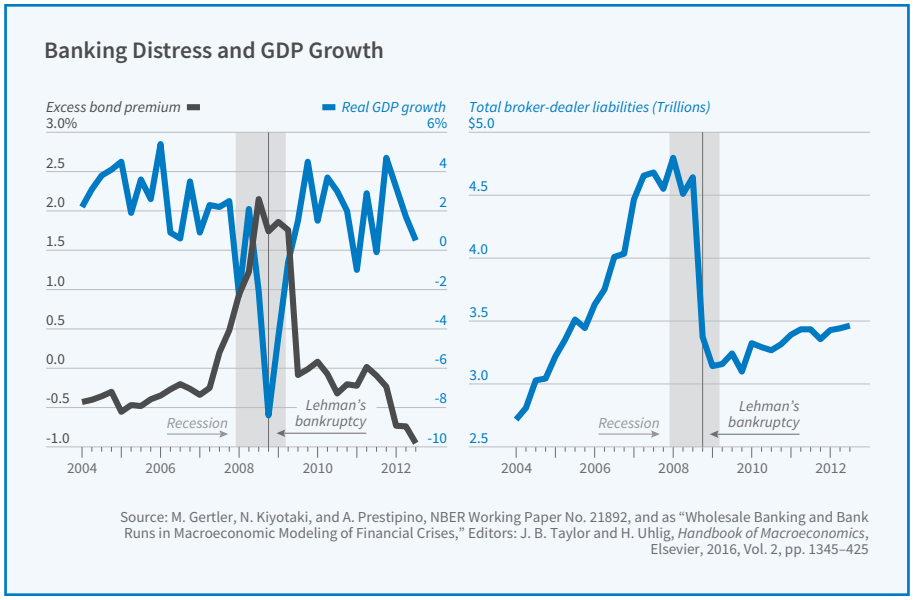


Figure 2

Once again, to establish causality it is necessary to go beyond the aggregate data. A number of microdata studies have shown how the banking distress induced contractions in real activity. As with the work on the household balance channel, the work on banking distress exploits cross-sectional variation to identify variation in banks' financial health that was unrelated to borrower quality. It then compares the behavior of borrowers who had relationships with financially stressed banks with those whose banks were in good financial health. For example, Gabriel Chodorow-Reich finds that firms that borrowed from commercial banks with exposure to Lehman Brothers experienced a much sharper contraction in employment than banks not directly exposed.[9] He shows further that the effects due to banking distress account for a significant fraction of the overall employment decline.

The banking crisis prompted a stream of research that incorporated banking in macroeconomic models, a feature conspicuously absent from pre-crisis models. A common dimension of the work was to introduce balance sheet constraints on banks stemming either from regulation or incentive problems between banks and their creditors. In these models, losses on loans induce a decline in equity, weakening the banks' balance sheets, inducing a tightening of credit and in turn a reduction in real activity. In this respect, the models capture the basic way in which financial distress played out during the Great Recession.[10]

Work following the initial wave of new research on banking focused on another important aspect of the crisis, namely the high degree of nonlinearity. Krishnamurthy, Stefan Nagel, and Dmitry Orlov note that financial crises feature sharp increases in credit spreads and sharp contractions in asset prices and output, which is consistent with the evidence presented in Figure 2.[11] There is no symmetric movement in these variables during booms. One way to introduce nonlinearity is to assume that balance sheet constraints bind only occasionally, as in work by Enrique Mendoza and also work by Zhiguo He and Krishnamurthy.[12] During booms the constraints are slack. However, a negative disturbance can move the economy into a region where the constraints are binding, amplifying the effect of the shock on the downturn. In contrast, recent work captures the nonlinearity by allowing for banking panics in the form of a rollover crisis, a situation in which suppliers of short-term debt in panic-like fashion decide to not roll over their loans to banks.[13] This kind of panic was a central feature of the crisis.

As to why the recovery from the banking crisis was so slow, Carmen Reinhart and Kenneth Rogoff argue in a classic study that the process of deleveraging by borrowers can lead to prolonged periods of low spending.[14] Robert Hall argues that the contraction in investment spending during the Great Recession was large enough to generate a nontrivial reduction

in the capital stock.[15] Finally, Hall, John Fernald, James Stock, and Mark Watson argue that the slow recovery was mainly the product of bad luck with some contractionary fiscal policy mixed in. The bad luck was a productivity slowdown that began in 2005, several years before the Great Recession, and is still continuing.[16]

• *Policy Responses to the Crisis*

Research has not only focused on improving our ability to analyze financial crises, but also on analyzing policy responses. For example, a key new tool the Federal Reserve used to combat the crisis was unconventional monetary policy, which involved adjusting the size and composition of its balance sheet. The prime example, popularly known as quantitative easing, involved purchasing agency mortgage-backed securities, agency debt, and long-term government debt, and funding these acquisitions by issuing short-term government debt in the form of interest-bearing government debt. With perfect financial markets, unconventional monetary policy is neutral: government intermediation of long-term securities simply displaces private intermediation with no effect on security prices and interest rates. During the Great Recession, however, the financial distress induced a contraction in investment banking, raising credit costs by elevating both credit spreads on private securities and term premiums on long-term bonds. In this kind of environment, unconventional monetary policy can be effective in reducing credit costs. Indeed, purchases of securities funded by interest-bearing reserves can be thought of as increasing government financial intermediation to offset the contraction of private intermediation. By doing so, it reduces both credit spreads and term premiums that had been elevated due to the crisis.[17]

In addition to research on how policy can respond as the crisis unfolds, there has also been work on regulatory policies designed to limit the likelihood of a crisis *ex ante*. Some of this work has focused on leverage restrictions on households in order to limit the possibility of the kind of large run-up of consumer debt that was a feature of the crisis.[18] Most of the work, though, has focused on the effects of regulatory capital requirements on banks.[19] A tradeoff that emerges is that tighter capital requirements reduce the likelihood of a crisis but also lower output, on average, due to the constraint on intermediation. In many settings, countercyclical capital buffers appear optimal. That is, if the goal is macroeconomic stability, capital requirements should be raised in good times and relaxed during recession. The high capital requirements force banks to build up a buffer that cushions them against negative shocks. Relaxing capital requirements in bad times permits more intermediation and thus reduces credit costs, facilitating the recovery.

Finally, the crisis forced us to think further about conventional monetary and fiscal policy. For monetary policy, the challenge was confronting the zero lower bound (ZLB) on the nominal interest rate. Earlier research suggested that a central bank could use forward guidance to manage expectations of the future path of the policy rate in this kind of environment. A general finding is that when the central bank is confronting a liquidity trap, expansionary policy involves a promise to keep rates "lower for longer," that is, keep them low beyond the point at which the ZLB is not binding.[20] Lengthening the expected period of low rates provides stimulus to the economy by reducing longer-term rates.

The existing models suggest a counterfactually powerful effect of forward guidance. This conundrum, dubbed the "forward guidance puzzle," has attracted considerable attention because, among other things, it suggests that the standard models may not be trustworthy for analyzing policy that relies on managing private-sector expectations. Some researchers have argued that allowing for financial market frictions can address the puzzle, while others suggest a behavioral or incomplete information approach to introduce myopia.[21] Emmanuel Farhi and Iván Werning argue that a combination of financial fractions and myopia is needed to produce plausible quantitative results.[22]

Finally, given constraints on monetary policy, fiscal policy provides an option when the economy hits the ZLB. A key question is the interaction between fiscal policy and the ZLB. It is possible at the zero lower bound to increase the fiscal multiplier due to the feedback effect of inflation on the real interest rate, with the nominal interest rate unchanged due to the ZLB.[23] Emi Nakamura and Jón Steinsson provide evidence using state data that accommodative monetary policy increases the fiscal multiplier.[24] There is also some empirical evidence suggesting that fiscal multipliers are stronger in recessions.[25]

2. Economic Growth

Economic growth is a thriving topic of inquiry. This section highlights two findings in particular. The first is declining business dynamism amidst lackluster productivity growth. The second is substantial—perhaps growing—misallocation of capital and labor across firms and establishments.

• *Declining Dynamism and Lackluster Growth*

Productivity growth—as opposed to growth in human and physical capital—is the main force behind rising output per worker hour.[26] Firms, in turn, are key contributors to productivity growth. Those firms that successfully innovate survive and grow. Those that fail to innovate shrink and die. The rise and fall of firms is considered an essential byproduct of progress. This notion goes back to Joseph Schumpeter's conception of creative destruction.[27] In this vein, a major finding is that the entry and exit rates of firms and establishments have been falling in the United States in recent

decades.[28] A corollary is that reallocation of labor across firms and establishments has slowed.[29] Young firms tend to grow faster than older firms, even conditional on size.[30] And young firms appear to be more innovative than older firms in the sense of patenting more per unit of employment and receiving more citations to their patents.[31] Falling entry rates and exit rates, combined with falling reallocation among incumbents, are consistent with falling rates of creative destruction and innovation by entering firms and establishments.

Figure 3 shows that productivity growth has ebbed and flowed in the United States over the last 70 years. After exceeding 2.5 percent per year in the period 1949–73, growth slowed to less than 1 percent per year in 1974–95—the infamous productivity growth slowdown. Growth surged to above 2.5 percent again for a decade beginning in the mid-1990s, largely fueled by industries producing and using information technology.[32] Since 2005, however, growth has faltered again, to about 1 percent per year.

Declining business dynamism is one reason for the meager productivity growth.[33] But it may not be the primary contributor, at least not directly.[34] Incumbent firms do most R&D and patenting, and most growth appears to come from quality improvements by incumbents on their own products.[35]

A leading view is that the slowdown is a byproduct of slowing population growth.[36] It appears that ideas are getting harder to find as the level of technology attained rises.[37] In this view, growth has been maintained through rising research effort. Population growth feeds this by providing more talent to search for new ideas and by expanding the size of the market for selling products embodying those ideas. A contrarian view holds that the slowdown itself is illusory because growth is increasingly difficult to measure. But measuring growth has always been challenging.[38] Official measures may understate growth, but not increasingly so.[39]

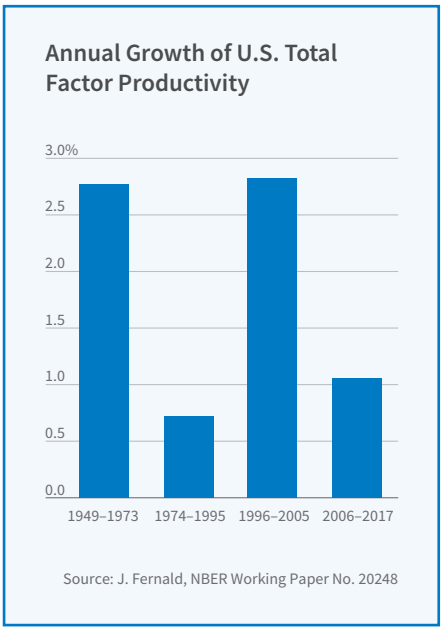


Figure 3

• *Misallocation*

In addition to innovation within firms, the level of U.S. productivity reflects the efficiency with which capital and labor are allocated across a given set of firms.[40] There are large differences in the ratio of revenue to inputs across firms and establishments, which may reflect gaps in the value of marginal products and therefore misallocation.[41] Such gaps are best documented in manufacturing and, as Figure 4 suggests, are larger in China and India than in the United States.[42]

The gaps may stem partly from adjustment costs that are technologically avoidable and hence do not represent misallocation.[43] But the gaps are too persistent to reflect adjustment costs alone.[44] Misallocation may contribute to both differences in levels and growth rates of productivity across countries.[45] Financial frictions are one possible source of misallocation.[46] Financial frictions, like adjustment costs, might be expected to have transitory effects on the allocation of inputs in the absence of ongoing idiosyncratic shocks.[47]

Another possible source of misallocation is markup dispersion.[48] Price-cost markups could differ persistently across firms or even establishments within firms. Because markups may differ even within industries, they can cause larger allocative distortions than cross-industry markup dispersion.[49] Even average markups can distort intermediate inputs and labor supply.[50] Rising markups have been tied to the declining fraction of national income going to workers, in the U.S. and elsewhere.[51]

Static misallocation of inputs can, in turn, undermine dynamic incentives to increase productivity and expand into more establishments.[52] Firms may exhibit slower growth over their life cycle if they face frictions in hiring and/or firing workers and in financing capital.[53]

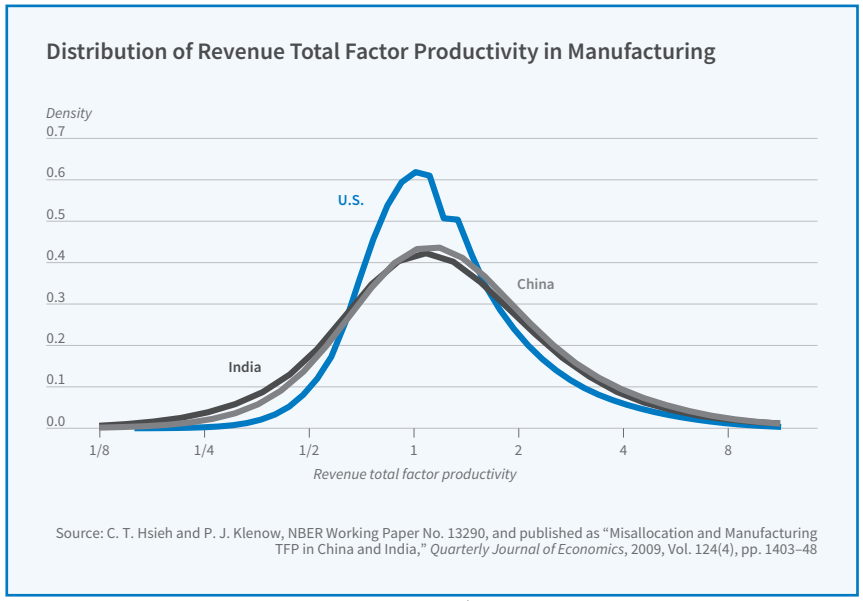


Figure 4

Figure 5 shows that, conditional on survival, establishments grow faster in the United States than in Mexico and India.

Misallocation can take many other forms, such as the allocation of crops to farmland, the allocation of land to farmers, and the allocation of talent across occupations. And declining discrimination against women and African Americans may have boosted U.S. growth for much of the past 50 years.[54]

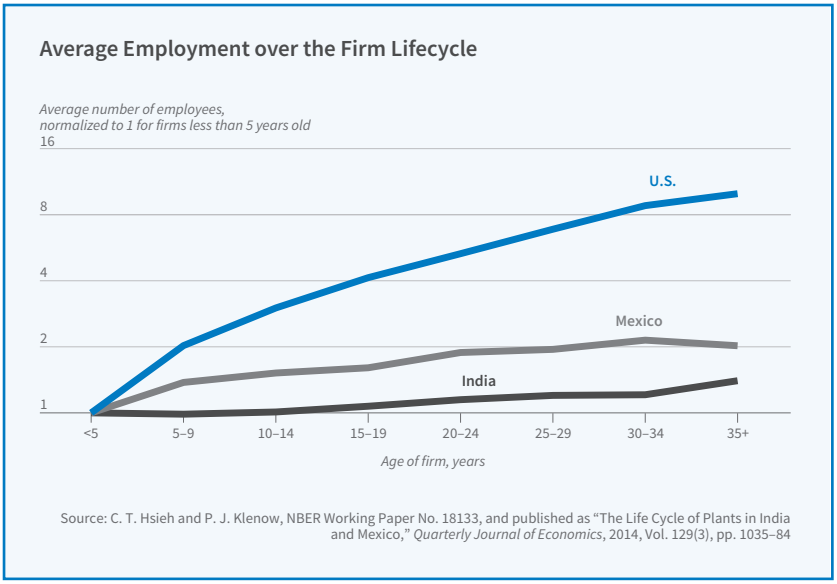


Figure 5

3. Income and Wealth Inequality and Macroeconomics

Over the last three decades, macroeconomists have become more interested in the study of inequality. The links between the distributional dynamics of income, human capital, and financial wealth, and their aggregate dynamics now constitute a vast area of research with clear relevance to current policy concerns.

Recently, the field has increasingly (and naturally) shifted toward empirical and quantitative studies, thanks to increasingly sophisticated data and methodologies. At the same time, it retains strong links with the theoretical work carried out earlier. This section highlights recent advances and findings in four areas: long-run trends and recent dynamics of income and wealth distributions; links between human capital, social mobility, and residential segregation; technological change and labor market institutions; and the effects of specific policy reforms.

• *Long-run Trends and Income and Wealth Dynamics*

While many studies document trends in income inequality, it is difficult to find reliable data spanning long periods on wealth inequality. Emmanuel Saez and Gabriel Zucman[55] estimate its evolution in the United States since 1913 by combining individual income tax returns with macroeconomic household balance sheets and capitalizing reported incomes [Figure 6]. Wealth concentration was high early in the 20th century, then fell from 1929 to 1978, and has continuously increased since. The top 0.1 percent's wealth share rose from 7 percent in 1978 to 22 percent in 2012, about as high as it was in 1929. High wealth today tends to be associated with high income much more than in the past. An increase in saving-rate inequality is also documented to be an important factor.

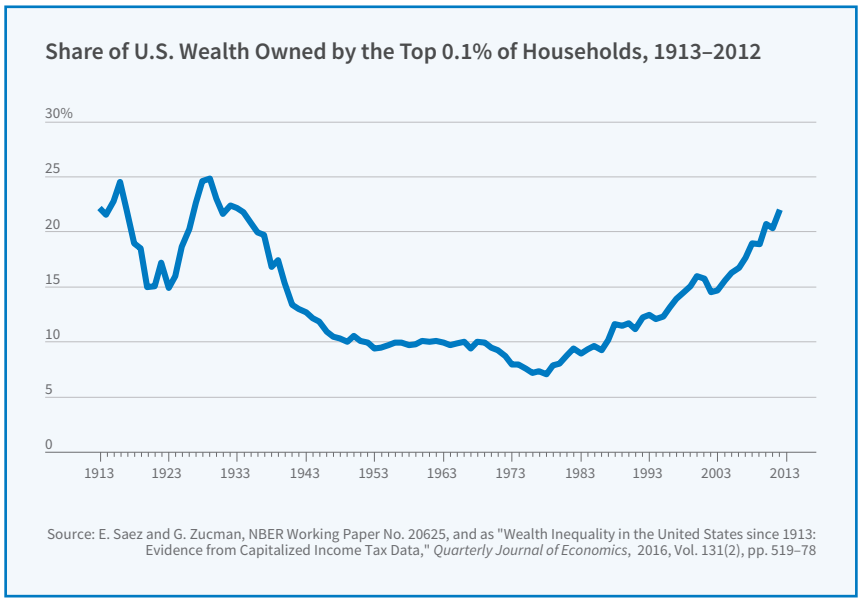


Figure 6

Xavier Gabaix, Jean-Michel Lasry, Pierre-Louis Lions, and Benjamin Moll ask whether standard random-growth models for the evolution of the income distribution can be modified to explain the large increase in the upper tail of the distribution.[56] Two departures from the standard framework help: heterogeneity in the "type" of different individuals, and "scale dependence." The first admits the possibility that some individuals—such as entrepreneurs—can attain higher returns on their wealth than the rest of the population. The second allows for multiplicative shocks to the income distribution that can have large effects on high incomes, rather than just additive shocks, which tend to have smaller effects in producing very high incomes. The framework is tractable and yields an analytical characterization of the speed of convergence of the cross-sectional income distribution. In a related study, Jess Benhabib, Alberto Bisin, and Mi

Luo match a parsimonious macroeconomic model to key moments of the distribution of wealth and the social-mobility matrix.[57] This allows them to disentangle the contribution of three factors, all of which are found to be important in replicating the thick upper tail of incomes and the observed extent of social mobility: heterogeneous and random returns to wealth, heterogeneity in savings, and capital-income risk.

These findings align well with those of an empirical study by Andreas Fagereng, Luigi Guiso, Davide Malacrino, and Luigi Pistaferri.[58] Using tax records from Norway, their study documents significant heterogeneity in the returns investors earn on their assets. Interestingly, this does not solely arise from different portfolio allocation between safe and risky assets: Returns are heterogeneous even within asset classes, and moreover they are persistently positively correlated with wealth [Figure 7]. All of these studies conclude that heterogeneous returns to wealth are an important determinant of persistent wealth inequality.

A number of studies have focused specifically on the distributional effects of the Great Recession, particularly for low incomes. Dirk Krueger, Kurt Mitman, and Fabrizio Perri construct a heterogeneous-agent model with incomplete markets.[59] Since this class of models, when calibrated to a realistic income process, fails to produce sufficient dispersion in the wealth distribution, the researchers augment it with preference heterogeneity, idiosyncratic labor income risk, and a life-cycle structure that allows them to consider Social Security and unemployment insurance. The augmented model fits the empirical distribution well, and in particular features a realistically large proportion of agents with low wealth. When these wealth-poor agents are hit by a large aggregate shock, they adjust their consumption dramatically, which makes the model consistent with the evidence of a large fall in consumption during the Great Recession.

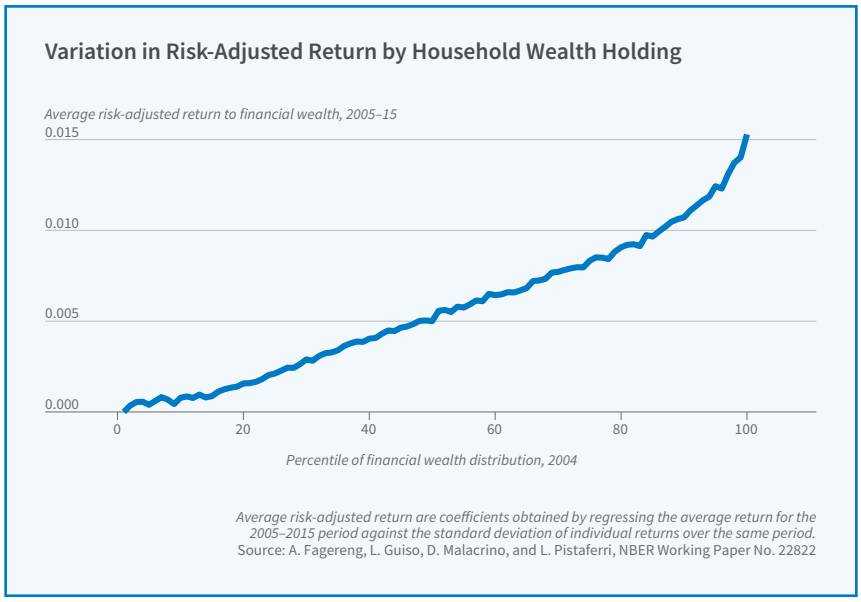


Figure 7

- ***Inequality, Human Capital, and Residential Segregation***

Leaving aside the very top of the income distribution, growing inequality in the United States and elsewhere stems in important part from increasing skill and educational premiums, together with large differences in human capital across households. A growing applied microeconomics literature finds that a significant part of this inequality can be traced back to early childhood, and that programs targeting poor families can have important effects on the cognitive and noncognitive skills of their children. Early work by Oded Galor and Joseph Zeira showed how, due to credit-market imperfections, inequality can have adverse effects on aggregate human capital formation and income growth.[60] Diego Daruich examines quantitatively the macroeconomic consequences of large-scale early-childhood development policies.[61] Using a dynamic general-equilibrium macro model, he traces the cumulative effects of such interventions on the skill formation of successive generations and finds that the resulting welfare gains are twice as large in the long run as in the short run, even taking into account attenuating general-equilibrium effects, such as those of taxation.

Matthias Doepke and Fabrizio Zilibotti relate inequality, parenting practices, and the process of human capital formation.[62] They document that, in countries with high and growing economic inequality such as the United States and China, parents push their children harder to become academic achievers, whereas in more equal societies like Sweden, Germany, and Japan, parents care more about promoting their children's independent development. Within the United States, the researchers document an increasing "parenting gap" between richer and poorer families, raising the prospect of diminished social mobility and fewer opportunities for children from disadvantaged backgrounds.

Another key driver of both inequality and intergenerational social mobility is residential and social segregation. Alessandra Fogli and Veronica Guerrieri document a significant correlation between income inequality and residential segregation over the last three decades, both in the time-series and across metropolitan statistical areas.[63] They construct a dynamic general-equilibrium model in which local spillovers in education generate a feedback mechanism between segregation and income inequality. Calibrating the

model using census data to match the micro estimates of these spillovers from Raj Chetty and Nathaniel Hendren,[64] they show that endogenous residential segregation substantially magnifies the effects of exogenous increases in the returns to education. A closely related amplifying mechanism is assortative mating in the marriage market. As people live in increasingly stratified neighborhoods, highly educated people meet mostly highly educated people, so it is harder for those coming from the lower ranks of society to move up the ladder through marrying up, a traditional vehicle of social mobility. Lasse Eika, Magne Mogstad, and Basit Zafar study the extent of educational assortative matching in the U.S. and four European countries,[65] and show that it is indeed an important determinant of the level of inequality. In terms of time trends for the U.S., however, they find mixed results: Since the 1980s, there has been little change in educational assortative mating, suggesting that this may not have been a primary factor in the rising inequality observed here in recent decades.

The debate on the relationship between technology and the income distribution has been lively since the late 1980s, and in recent years, artificial intelligence and automation have attracted substantial attention. Daron Acemoglu and Pascual Restrepo present evidence that robots are substituting for jobs in manufacturing.[66] David Autor and Anna Salomons argue that automation shifts labor across industries and pushes down labor's share of income within industries.[67]

Through incomes and a variety of other channels, innovation and creative destruction ultimately affect people's well-being. This is especially important in light of the evidence that, over recent years, certain groups in the population — most notably, white males in middle age — exhibited a significant deterioration in their health and perceived welfare. Philippe Aghion, Ufuk Akcigit, Angus Deaton, and Alexandra Roulet document that job destruction associated with innovation tends to decrease subjective well-being, but less so in the presence of more generous unemployment benefits.[68]

- ***Tax and Regulatory Reforms***

Policy is, of course, another important determinant of the distribution of incomes, both pre-and post-tax. Stefania Albanesi and Jaromir Nosal study the effects of a 2005 reform of personal bankruptcy in the United States, the Bankruptcy Abuse Prevention and Consumer Protection Act, which increased the costs of filing and restricted eligibility.[69] Using administrative credit-file data, the study documents that this act caused a large drop in filings for straight bankruptcy, especially for low-income individuals, but also a large permanent rise in insolvency. They conclude that the reform may have reduced the provision of valuable insurance for poor households. Katrine Jakobsen, Kristian Jakobsen, Henrik Kleven, and Zucman document the effects of wealth taxes on wealth accumulation, using administrative data from Denmark.[70] This country had a large wealth tax, which was first reduced and then abolished between 1989 and 1997. The researchers construct a lifecycle model and show that a calibrated version predicts a high long-run elasticity of wealth with respect to the net-of-tax return, especially for the wealthiest individuals, hence a substantial impact on inequality.

4. Methodological Advance: Heterogeneous Agent Models

Stimulated in part by the need to better understand the dynamics of the 2008 financial crisis and the impact of the policy response, heterogeneous agent modeling has been an area in which research has advanced rapidly in recent years. Models in this tradition focus on differences across households or firms as critical for macroeconomic dynamics. Progress on this topic has included both important methodological advances and substantive findings. Two areas in which there have been particularly important applications are the study of how heterogeneity affects the transmission of monetary and fiscal policy, and the use of regional heterogeneity to draw implications about aggregate behavior.

Prior to the Great Recession, many researchers used the representative household framework with perfect financial markets to analyze monetary and fiscal policy. In addition to being unrealistic, the representative agent framework predicts a very strong response of household consumption to interest rates due to intertemporal substitution. That is not seen in the data, which makes the framework questionable for studying monetary policy. The heterogeneous agent framework allows for borrowing and lending among households, along with realistic frictions in this process. Because this framework recognizes that a sizeable fraction of households face borrowing constraints, overall consumption is not as sensitive to interest rate movements in this framework as in the representative agent setting. Accordingly, the heterogeneous agent framework is better able to capture the monetary policy transmission mechanism and the distributional consequences of monetary policy.[71]

On the other hand, the representative agent framework understates the effect of fiscal policy. The Ricardian equivalence theorem, which implies that tax cuts do not affect household spending, holds: Households simply adjust saving to pay future taxes. Within the heterogeneous agent framework, tax cuts stimulate spending due to the fact that some households are at or near their respective borrowing constraints. Accordingly, the heterogeneous agent framework offers a more realistic approach to studying fiscal policy.[72]

In part because of the substantial differences across places in the severity of the Great Recession, in recent studies researchers have estimated local employment, wage, consumption, and output elasticities with respect to plau-

sibly identified exogenous regional shocks. Given the importance of general equilibrium forces, these regional elasticities to a given shock do not directly measure aggregate elasticities to the same shock. In order to translate well-identified regional elasticities to meaningful aggregate elasticities for macroeconomic analysis, some additional structure is needed. Several important papers have developed procedures linking well-identified regional estimates so that they speak more directly to issues of aggregate fluctuations. For example, Nakamura and Steinsson use a structural model to show how estimates of local government multipliers can inform aggregate multipliers.[73] Martin Beraja, Erik Hurst, and Juan Ospina develop a methodology to combine regional data with aggregate data to discipline nominal wage rigidities in New Keynesian models.[74] Beraja, Andreas Fuster, Hurst, and Joseph Vavra use regional variation to explore the time-varying aggregate effects of monetary policy.[75] Rodrigo Adao, Costas Arkolakis, and Federico Esposito use a structural model to map well identified estimates of the local employment effects of trade shocks to aggregate employment trends.[76] Callum Jones, Midrigan Virgiliu, and Thomas Philippon were among the first to use regional data in an equilibrium dynamic macro model to study the origins of the Great Recession.[77]

---

1 *M. Gertler and S. Gilchrist, "What Happened: Financial Factors in the Great Recession," NBER Working Paper No. 24746, June 2019,* provide a time line of the crisis that highlights these two channels.
Return to Text

2 *O. Jordà, M. Schularik, and A. Taylor, "Macrofinancial History and the New Business Cycle Facts," NBER Working Paper No. 22743, October 2016.*
Return to Text

3 *A. Krishnamurthy and T. Muir, "How Credit Cycles Across a Financial Crisis," NBER Working Paper No. 23850, September 2017.*
Return to Text

4 *A. Mian and A. Sufi, "House Prices, Home Equity-Based Borrowing, and the U.S. Household Leverage Crisis," NBER Working Paper No. 15283, August 2009, and A. Mian and A. Sufi, "What Explains High Unemployment? The Aggregate Demand Channel," NBER Working Paper No. 17830, February 2012.*
Return to Text

5 A voluminous empirical literature has followed that essentially confirms Mian and Sufi's findings, including, for example, *G. K. Mitman and G. Violante, "Non-durable Consumption and Housing Net Worth in the Great Recession: Evidence from Easily Accessible Data," NBER Working Paper No. 22232, May 2016; and C. Jones, V. Midrigan, and T. Philippon, "Household Leverage and the Recession," NBER Working Paper No. 16965, April 2011.*
Return to Text

6 Examples of models with this feature include *V. Guerrieri and G. Lorenzoni, "Credit Crises, Precautionary Savings, and the Liquidity Trap," NBER Working Paper No. 17583, November 2011; G. Kaplan, K. Mitman, and G. Violante, "The Housing Boom and Bust: Model Meets Evidence," NBER Working Paper No. 23694, August 2017; D. Berger, V. Guerrieri, G. Lorenzoni, and J. Vavra, "House Prices and Consumer Spending," NBER Working Paper No. 21667, October 2015; and A. Justiniano, G. Primiceri, and A. Tambalotti, "Credit Supply and the Housing Boom," NBER Working Paper No. 20874, January 2015.*
Return to Text

7 *M. Gertler, N. Kiyotaki, and A. Prestipino, "A Macroeconomic Model with Financial Panics," NBER Working Paper No. 24126, December 2017,* provides a timeline of the rise and fall of the shadow banking sector.
Return to Text

8 *S. Gilchrist and E. Zakrajšek, "Credit Spreads and Business Cycle Fluctuations," NBER Working Paper No. 17021, May 2011.*
Return to Text

9 *G. Chodorow-Reich, "The Employment Effects of Credit Market Disruptions, Firm-level Evidence from the 2008-2009 Financial Crisis,"* Quarterly Journal of Economics, *129(1), 2013, pp. 1–59.* For related evidence on how the disruption of intermediation financial affected non-financial firms, see *G. Chodorow-Reich and A. Falato, "The Loan Covenant Channel: How Bank Health Transmits to the Real Economy," NBER Working Paper No. 23879, September 2017; S. Gilchrist, R. Schoenle, J. Sim, and E. Zakrajšek, "Inflation Dynamics During the Financial Crisis," NBER Working Paper No. 22827, November 2016; B. Chen, S. Hanson, and J. Stein, "The Decline of Big-Bank Lending to Small Business: Dynamic Impacts on Local Credit and Labor Markets," NBER Working Paper No. 23843, September 2017. E. Benmelech, R. Meisenzahl, and R. Ramcharan, "The Real Effects of Liquidity During the Financial Crisis: Evidence from Automobiles," NBER Working Paper No. 22148, April 2016,* present evidence on how such disruptions affected household auto demand.
Return to Text

10 *Z. He and A. Krishnamurthy, "A Macroeconomic Framework for Quantifying Systemic Risk," NBER Working Paper No. 19885, February 2014,* present a model in this tradition.
Return to Text

11 *A. Krishnamurthy, S. Nagel, and D. Orlov, "Sizing Up Repo," NBER Working Paper No. 17768, January 2012.*
Return to Text

12 *E. Mendoza, "Sudden Stops, Financial Crises, and Leverage: A Fisherian Deflation of Tobin's Q," NBER Working Paper No. 14444, October 2008; Z. He and A. Krishnamurthy, "A Macroeconomic Framework for Quantifying Systemic Risk," NBER Working Paper No. 19885, , February 2014, revised May 2019.*
Return to Text

13 *M. Gertler and N. Kiyotaki, "Banking, Liquidity, and Bank Runs in an Infinite-Horizon Economy," NBER Working Paper No. 19129, June 2013; and ibid., NBER Working Paper No. 24126.*
Return to Text

14 *C. Reinhart and K. Rogoff,* This Time is Different: Eight Centuries of Financial Folly, *Princeton, N.J.: Princeton University Press, 2009.*
Return to Text

[15] *R. Hall, "Quantifying the Lasting Harm to the U.S. Economy from the Financial Crisis," NBER Working Paper No. 20183, May 2014.*
Return to Text
[16] *J. Fernald, R. Hall, J. Stock, and M. Watson, "The Disappointing Recovery of Output after 2009," NBER Working Paper No. 23543, June 2017.*
Return to Text
[17] Empirical work by *A. Krishnamurthy and A. Vissing-Jorgensen, "The Effects of Quantitative Easing on Interest Rates: Channels and Implications for Policy," NBER Working Paper No. 17555,* and others provides evidence for this kind of mechanism.
Return to Text
[18] Examples include *E. Farhi and I. Werning, "A Theory of Macroprudential Policies in the Presence of Nominal Rigidities," NBER Working Paper No. 19313, and A. Korinek and A. Simsek, "Liquidity Trap and Excessive Leverage," NBER Working Paper No. 19970, March 2014.*
Return to Text
[19] Examples include *E. Farhi and J. Tirole, "Collective Moral Hazard, Maturity Mismatch, and Systemic Bailouts," NBER Working Paper No. 15138, July 2009; V. Chari and P. Kehoe, "Bailouts, Time Inconsistency, and Optimal Regulation," NBER Working Paper No. 19192, June 2013; and J. Bianchi and E. Mendoza, "Optimal Time-Consistent Macroprudential Policy," NBER Working Paper No. 19704, December 2013.*
Return to Text
[20] *I. Werning, "Managing a Liquidity Trap: Monetary and Fiscal Policy," NBER Working Paper No. 17344, August 2011.*
Return to Text
[21] Research on this topic includes *A. McKay, E. Nakamura, and J. Steinsson, "The Power of Forward Guidance Revisited," NBER Working Paper No. 20882, January 2015; M. Garcia-Schmidt and M. Woodford, "Are Low Interest Rates Deflationary? A Paradox of Perfect-Foresight Analysis," NBER Working Paper No. 21614, October 2015; G. Angeletos and C. Lian, "Forward Guidance without Common Knowledge," NBER Working Paper No. 22785, October 2016; and X. Gabaix, "A Behavioral New Keynesian Model," NBER Working Paper No. 22954, December 2016.*
Return to Text
[22] *E. Farhi and I. Werning, "Monetary Policy, Bounded Rationality, and Incomplete Markets," NBER Working Paper No. 23281, March 2017.*
Return to Text
[23] *L. Christiano, M. Eichenbaum, and S. Rebelo, "When Is the Government Spending Multiplier Large?" NBER Working Paper No. 15394, October 2009.*
Return to Text
[24] *E. Nakamura and J. Steinsson, "High Frequency Identification of Monetary Non-Neutrality: The Information Effect," NBER Working Paper No. 19260, July 2013.*
Return to Text
[25] *A. Auerbach and Y. Gorodnichenko, "Fiscal Multipliers in Recession and Expansion," NBER Working Paper No. 17447, September 2011; V. Ramey, "Ten Years after the Financial Crisis: What Have We Learned from the Renaissance in Fiscal Research?" NBER Working Paper No. 25531, February 2019,* suggests caution in drawing conclusions about the variation in the fiscal multiplier over the cycle.
Return to Text
[26] *C. Jones, "The Facts of Economic Growth," NBER Working Paper No. 21142, May 2015, and* Handbook of Macroeconomics*, 2, 2016, pp. 3–69.*
Return to Text
[27] *P. Aghion, U. Akcigit, and P. Howitt, "What Do We Learn From Schumpeterian Growth Theory?" NBER Working Paper No. 18824, February 2013; and* Handbook of Economic Growth*, 2, 2016, pp. 515–63.*
Return to Text
[28] *U. Akcigit and S. Ates, "Ten Facts on Declining Business Dynamism and Lessons from Endogenous Growth Theory," NBER Working Paper No. 25755, April 2019.*
Return to Text
[29] *R. Decker, J. Haltiwanger, R. Jarmin, and J. Miranda, "Changing Business Dynamism and Productivity: Shocks vs. Responsiveness," NBER Working Paper No. 24236, January 2018.*
Return to Text
[30] *J. Haltiwanger, R. Jarmin, and J. Miranda, "Who Creates Jobs? Small vs. Large vs. Young," NBER Working Paper No. 16300, August 2010, and* Review of Economics and Statistics*, 95(2), 2013, pp. 347–61.*
Return to Text
[31] *U. Akcigit and W. Kerr, "Growth through Heterogeneous Innovations," NBER Working Paper No. 16443, November 2010, and* Journal of Political Economy*, 126(4), 2018, pp. 1374–1443.*
Return to Text
[32] *J. Fernald, "Productivity and Potential Output Before, During, and After the Great Recession," NBER Working Paper No. 20248, June 2014, and* NBER Macroeconomics Annual 2014*, pp. 1–51.*
Return to Text
[33] *T. Alon, D. Berger, R. Dent, and B. Pugsley, "Older and Slower: The Startup Deficit's Lasting Effects on Aggregate Productivity Growth," NBER Working Paper No. 23875, September 2017, and* Journal of Monetary Economics*, 93, 2018, pp. 68–85.*
Return to Text
[34] *D. Garcia-Macia, C. Hsieh, and P. Klenow, "How Destructive is Innovation?" NBER Working Paper No. 22953, December 2016,* and forthcoming in Econometrica*.*
Return to Text
[35] *C. Hottman, S. Redding and D. Weinstein, "Quantifying the Sources of Firm Heterogeneity," NBER Working Paper No. 20436, August 2014, and* Quarterly Journal of Economics*, 131(3), 2016, pp. 1291–364.*
Return to Text
[36] *R. Gordon, "Why Has Economic Growth Slowed When Innovation Appears to be Accelerating?" NBER Working Paper No. 24554, April 2018.*
Return to Text
[37] *N. Bloom, C. Jones, J. Van Reenen, and M. Webb, "Are Ideas Getting Harder to Find?" NBER Working Paper No. 23782, September 2017.*
Return to Text

[38] *C. Syverson, "Challenges to Mismeasurement Explanations for the U.S. Productivity Slowdown," NBER Working Paper No. 21974, February 2016, and* Journal of Economic Perspectives*, 31(2), 2017, pp. 165–86.*
Return to Text

[39] *P. Aghion, A. Bergeaud, T. Boppart, P. Klenow, and H. Li, "Missing Growth from Creative Destruction," NBER Working Paper No. 24023, November 2017,* and forthcoming in American Economic Review.
Return to Text

[40] *D. Restuccia and R. Rogerson, "The Causes and Costs of Misallocation," NBER Working Paper No. 23422, May 2017, and* Journal of Economic Perspectives*, 31(3), 2017, pp. 151–74.*
Return to Text

[41] *C. Syverson, "What Determines Productivity?" NBER Working Paper No. 15712, January 2010, and* Journal of Economic Literature*, 49(2), 2011, pp. 326–65.*
Return to Text

[42] *C. Hsieh and P. Klenow, "Misallocation and Manufacturing TFP in China and India," NBER Working Paper No. 13290, August 2007, and* Quarterly Journal of Economics*, 124(4), pp. 1403–48, 2009.*
Return to Text

[43] *A. Collard-Wexler, J. Asker, and J. De Loecker, "Productivity Volatility and the Misallocation of Resources in Developing Economies," NBER Working Paper No. 17175, June 2011, and published as "Dynamic Inputs and Resource (Mis) Allocation,"* Journal of Political Economy*, 122(5), 2014, pp. 1013–63.*
Return to Text

[44] *J.M. David and V. Venkateswaran, "The Sources of Capital Misallocation," NBER Working Paper No. 23129, February 2017, and forthcoming in the* American Economic Review.
Return to Text

[45] *G. Gopinath, S. Kalemli-Ozcan, L. Karabarbounis, and C. Villegas-Sanchez, "Capital Allocation and Productivity in South Europe," NBER Working Paper No. 21453, August 2015, and* Quarterly Journal of Economics*, 132(4), 2017, pp. 1915–67; Y. Gorodnichenko, D. Revoltella, J. Svejnar, and C.T. Weiss, "Resource Misallocation in European Firms: The Role of Constraints, Firm Characteristics, and Managerial Decisions," NBER Working Paper No. 24444, March 2018.*
Return to Text

[46] *F. Buera, J. Kaboski, and Y. Shin, "Finance and Development: A Tale of Two Sectors," NBER Working Paper No. 14914, April 2009, and* American Economic Review*, 101(5), 2011, pp. 1964-2002; A. Eisfeldt and Y. Shi, "Capital Reallocation," NBER Working Paper No. 25085, September 2018.*
Return to Text

[47] *V. Midrigan and D.Y. Xu, "Finance and Misallocation: Evidence from Plant-Level Data," NBER Working Paper No. 15647, January 2010, and* American Economic Review*, 104(2), 2014, pp. 422–58.*
Return to Text

[48] *M. Peters, "Heterogeneous Mark-ups and Endogenous Misallocation," MIT Working Paper, 2011.*
Return to Text

[49] *D. Baqaee and E. Farhi, "Productivity and Misallocation in General Equilibrium," NBER Working Paper No. 24007, November 2017.*
Return to Text

[50] *C. Edmond, V. Midrigan, D. Xu, "How Costly are Markups?" NBER Working Paper No. 24800, July 2018.*
Return to Text

[51] *D. Autor, D. Dorn, L. Katz, C. Patterson, and J. Van Reenen, "The Fall of the Labor Share and the Rise of Superstar Firms," NBER Working Paper No. 23396, May 2017; J. De Loecker and J. Eeckhout, "The Rise of Market Power and the Macroeconomic Implications," NBER Working Paper No. 23687, August 2017.*
Return to Text

[52] *U. Akcigit, H. Alp, and M. Peters, "Lack of Selection and Limits to Delegation: Firm Dynamics in Developing Countries," NBER Working Paper No. 21905, January 2016.*
Return to Text

[53] *C. Hsieh and P. Klenow, "The Life Cycle of Plants in India and Mexico," NBER Working Paper No. 18133, June 2012, and* Quarterly Journal of Economics*, 129(3), 2014, pp. 1035–84.*
Return to Text

[54] *C. Hsieh, E. Hurst, C. Jones, and P. Klenow, "The Allocation of Talent and U.S. Economic Growth," NBER Working Paper No. 18693, January 2013,* and forthcoming in Econometrica*.*
Return to Text

[55] *E. Saez and G. Zucman, "Wealth Inequality in the United States since 1913: Evidence from Capitalized Income Tax Data," NBER Working Paper No. 20625, October 2014, and* Quarterly Journal of Economics*, 131(2), 2016, pp. 519–78.*
Return to Text

[56] *X. Gabaix, J. Lasry, P. Lions, and B. Moll, "The Dynamics of Inequality," NBER Working Paper No. 21363, July 2015, and* Econometrica*, 84(6), 2016, pp. 2071–111.*
Return to Text

[57] *J. Benhabib, A. Bisin, and M. Luo, "Wealth Distribution and Social Mobility in the U.S.: A Quantitative Approach," NBER Working Paper No. 21721, December 2015, and* American Economic Review*, 109(5), 2019, pp. 1623–47.*
Return to Text

[58] *A. Fagereng, L. Guiso, D. Malacrino, and L. Pistaferri, "Heterogeneity and Persistence in Returns to Wealth," NBER Working Paper No. 22822, November 2016.*
Return to Text

[59] *D. Krueger, K. Mitman, and F. Perri, "Macroeconomics and Household Heterogeneity," NBER Working Paper No. 22319, June 2016.*
Return to Text

[60] *O. Galor and J. Zeira, "Income Distribution and Macroeconomics,"* Review of Economic Studies*, 60(1), 1993, pp. 35–52.*
Return to Text

[61] *D. Daruich, "The Macroeconomic Consequences of Early Childhood Development Policies," Federal Reserve Bank of Minneapolis System Working Paper 18–18, 2018.*
Return to Text

[62] *M. Doepke and F. Zilibotti, "Parenting with Style: Altruism and Paternalism in Intergenerational Preference Transmission," NBER Working Paper No.*

20214, June 2014, and Econometrica*, 85(5), 2017, pp. 1331–71.*
Return to Text

[63] *A. Fogli and V. Guerrieri, "The End of the American Dream? Inequality and Segregation in U.S. Cities," Mimeo, University of Chicago, Booth School of Business, 2018.*
Return to Text

[64] *R. Chetty and N. Hendren, "The Impacts of Neighborhoods on Intergenerational Mobility II: County-Level Estimates," NBER Working Paper No. 23002, and* Quarterly Journal of Economics*, 2018, 133(3), 2018, pp. 1163–1228.*
Return to Text

[65] *L. Eika, M. Mogstad, and B. Zafar, "Educational Assortative Mating and Household Income Inequality," NBER Working Paper No. 20271, July 2014, and forthcoming in* Journal of Political Economy.
Return to Text

[66] *D. Acemoglu and P. Restrepo, "Robots and Jobs: Evidence from U.S. Labor Markets," NBER Working Paper No. 23285, March 2017.*
Return to Text

[67] *D. Autor and A. Salomons, "Is Automation Labor-Displacing? Productivity Growth, Employment, and the Labor Share," NBER Working Paper No. 24871, July 2018.*
Return to Text

[68] *P. Aghion, U. Akcigit, A. Deaton, and A. Roulet, "Creative Destruction and Subjective Well-Being," NBER Working Paper No. 21069, April 2015, and* American Economic Review*, 106(12), 2016, pp. 3869–97.*
Return to Text

[69] *S. Albanesi and J. Nosal, "Insolvency after the 2005 Bankruptcy Reform," NBER Working Paper No. 24934, August 2018.*
Return to Text

[70] *K. Jakobsen, K. Jakobsen, H. Kleven, and G. Zucman, "Wealth Taxation and Wealth Accumulation: Theory and Evidence from Denmark," NBER Working Paper No. 24371, March 2018.*
Return to Text

[71] Studies that employ the heterogeneous agent approach to analyze monetary policy include *A. Auclert, "Monetary Policy and the Redistribution Channel," NBER Working Paper No. 23451, May 2017; G. Kaplan, B. Moll, and G. Violante, "Monetary Policy According to HANK," NBER Working Paper No. 21897, January 2016; A. McKay, E. Nakamura, and J. Steinsson, "The Power of Forward Guidance Revisited," NBER Working Paper No. 20882, January 2015; and I. Werning, "Incomplete Markets and Aggregate Demand," NBER Working Paper No. 21448, August 2015.*
Return to Text

[72] Studies that employ the heterogeneous agent approach to analyze fiscal policy include *M. Hagdorn, I. Manovskii, and K. Mitman, "The Fiscal Multiplier," NBER Working Paper No. 25571, February 2019; G. Kaplan and G. Violante, "A Model of the Consumption Response to Fiscal Stimulus Payments," NBER Working Paper No. 17338, August 2011; A. McKay and R. Reis, "The Role of Automatic Stabilizers in the U.S. Business Cycle," NBER Working Paper No. 19000, April 2013; and H. Oh and R. Reis, "Targeted Transfers and the Fiscal Response to the Great Recession," NBER Working Paper No. 16775, February 2011.*
Return to Text

[73] *E. Nakamura and J. Steinsson, "Fiscal Stimulus in a Monetary Union: Evidence from U.S. Regions," NBER Working Paper No. 17391, September 2011.*
Return to Text

[74] *M. Beraja, E. Hurst, and J. Ospina, "The Aggregate Implications of Regional Business Cycles," NBER Working Paper No. 21956, February 2016.*
Return to Text

[75] *M. Beraja, A. Fuster, E. Hurst, and J. Vavra, "Regional Heterogeneity and Monetary Policy," NBER Working Paper No. 23270, March 2017, and* Quarterly Journal of Economics*, 134(1), 2019, pp. 109–83.*
Return to Text

[76] *R. Adão, C. Arkolakis, and F. Esposito, "Spatial Linkages, Global Shocks, and Local Labor Markets: Theory and Evidence," NBER Working Paper No. 25544, February 2019.*
Return to Text

[77] *C. Jones, V. Midrigan, and T. Philippon, "Household Leverage and the Recession," NBER Working Paper No. 16965, April 2011.*
Return to Text

Lisa B. Kahn is a research associate in the NBER's Labor Studies Program. She is a professor of economics at the University of Rochester and a co-editor at the *Journal of Human Resources*.

Kahn's research focuses on understanding factors that shape workers' careers, including both external market forces such as recessions and technological change, and internal firm practices, especially those related to imperfect information. She received her Ph.D. in economics from Harvard University in 2008, and holds an A.B. in economics from the University of Chicago. She was previously an associate professor of economics at Yale School of Management. From 2010 to 2011, Kahn served on President Obama's Council of Economic Advisers as the senior economist for labor and education policy.

She grew up in Ithaca, N.Y., and currently lives in Rochester, N.Y., with her husband and their newborn daughter.

Changes in the Character of the Labor Market over the Business Cycle

Lisa B. Kahn

Economists have long been interested in the immediate consequences of business cycle fluctuations. However, until recently, they have paid less attention to the lasting impacts of recessions on workers and firms. In this piece, I summarize some of my research contributions toward a better understanding of how and why recessions impact workers' careers both in the short and long run.

I begin by summarizing my work showing that the Great Recession accelerated firm-level adoption of technologies that replaced routine labor. As a consequence, workers previously employed in routine-task occupations saw their skills rapidly depreciate and faced a more difficult recovery. I next discuss how the business cycle impacts the job ladder. Workers tend to move up a wage ladder across firms, gradually making their way to higher-paying firms as they accumulate labor market experience. Recessions impede this process, resulting in halting career progression, which is especially important for young workers. Both of these areas of research imply long-lasting consequences of recessions for certain groups of workers. Finally, I describe my work quantifying the lasting impacts of recessions on careers of new college graduates.

Technological Adoption and the Great Recession

One of the most important long-run trends in the U.S. labor market has been the shift in employment and wages away from occupations in the middle of the skill distribution toward those in the tails. This so-called polarization has been linked to technological change, whereby new machine technologies such as IT substitute for middle-skill jobs and are in turn complementary to high-skill cognitive jobs. Daron Acemoglu and David Autor provide a survey.[1]

Until recently, polarization had been thought to be a gradual, secular phenomenon. However, a long theoretical literature beginning with Joseph Schumpeter's conception of creative destruction suggests that adjustments to technological change may be more episodic. In boom times, high opportunity costs, or frictions such as adjustment costs, may inhibit resources from being reallocated optimally in the face of technological change.[2] Recessions lower the opportunity cost and can produce large enough shocks to overcome these frictions.

Whether adjustments to new technology are smooth or lumpy is important for policy and for our understanding of recoveries. The recoveries from the last three U.S. recessions (1991, 2001, 2007–09) have been jobless: employment was slow to rebound despite recovery in aggregate output. Nir Jaimovich and Henry E. Siu provide suggestive evidence that polarization and jobless recovery are linked, showing that the vast majority of declines in middle-skill employment have occurred during recessions and that, over the same time period, recovery was jobless only in these occupations.[3] If these episodic employment declines were driven by lumpy adjustment to existing technologies, they would leave a mass of displaced workers with the wrong skills for new production.

In a recent paper, Brad Hershbein and I provide direct evidence that firm-level technological adoption and restructuring of employment is episodic around recessions.[4] We use a new dataset collected by Burning Glass Technologies of the near-universe of electronically posted job vacancies to explore changes in demand for skill over the Great Recession. Exploiting spatial variation in economic conditions, we establish a new fact: The skill require-

ments of job ads experienced a relative increase in metropolitan statistical areas (MSAs) that suffered larger employment shocks in the Great Recession. The left panel of Figure 1 illustrates our results, using as the dependent variable whether an ad contains a cognitive skill requirement. We obtain this skill measure from work I have done with David Deming to categorize a range of keywords found in the job ads data into 10 general skills, including cognitive, which includes key words and fragments like "analy," "decision," and "thinking."[5] A hard-hit MSA sees an increase in demand for cognitive skill, relative to its starting point in 2007 and relative to a less-hard-hit MSA. We find the same effects for a range of skill requirements that are known to be complementary with routine-labor replacing technologies. Moreover, the vast majority of this "upskilling" persists through the end of our sample in 2015, even while most measures of local labor-market strength had returned to pre-recession levels.

These patterns collectively raise the possibility that a structural shift in the demand for skill occurred disproportionately in harder-hit MSAs. If such a structural shift occurred and were driven by technological change, we would expect changes in these skill requirements to be accompanied by changes in production technologies as well. Indeed, we find that increases in skill requirements are positively correlated with capital investments at both the MSA and firm levels. The right panel of Figure 1 illustrates one piece of evidence. Using the CI Technology Database from Harte Hanks, a market intelligence firm, we show that harder-hit MSAs exhibited a relative increase in IT investments, as measured by the adoption of personal computers, at the same time as they upskilled in job postings. These differences across MSAs emerge only after the Great Recession and, once again, persist through our sample period. We also link firms in our job postings database to those in the Harte Hanks database, as well as to publicly traded firms in Compustat. We show that firms increasing their capital investments, based on PC adoption and physical capital holdings, are also more likely to upskill. Thus, increased demand for labor skill appears closely linked to both general and IT capital investment.

Taken together, our results suggest that firms in harder-hit cities were induced to restructure their production toward greater use of technology and higher-skilled workers; that is, the Great Recession hastened the polarization of the U.S. labor market. We demonstrate that during the Great Recession, firms changed not only whom they would hire in the recovery, but how they would produce. Instead of occurring gradually, with relatively few workers needing to be reallocated at any given time, we find that changes in demand for skill were episodic, resulting in a swath of displaced workers whose skills were suddenly rendered obsolete as firms ratcheted up their requirements. The need to reallocate workers on such a large scale may drive jobless recoveries. This also has distributional consequences, given that low-skill workers are well known to suffer worse employment and wage consequences in recessions. Finally, this type of episodic reallocation likely plays a role in the well-noted and marked decline in male employment-to-population ratios over the past 25 years, especially since these declines have been stair-step around recessions.

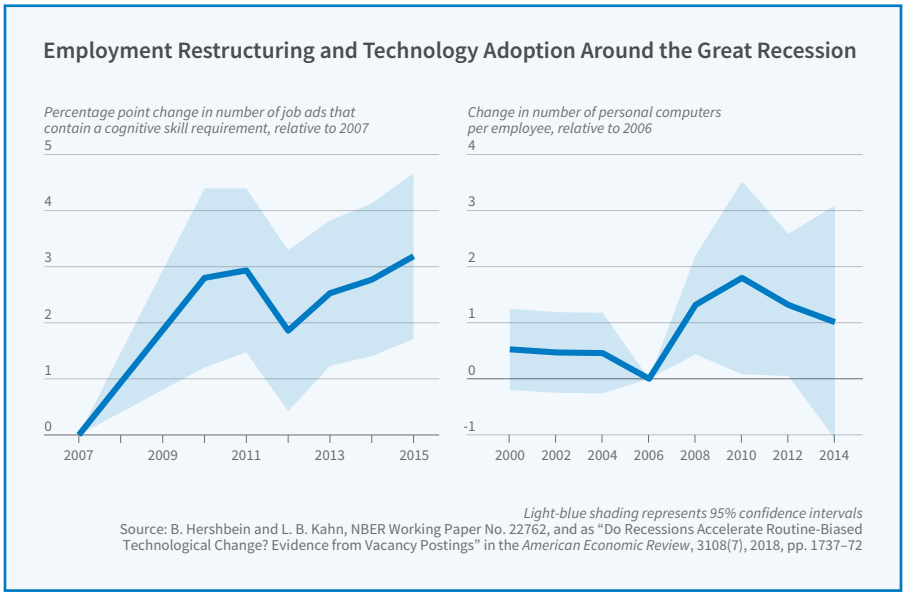


Figure 1

Cyclical Job Ladders

Job mobility plays a central role in earnings growth over the life cycle. Despite frictions that can inhibit worker sorting, such as search costs or imperfect information, workers are thought to gradually climb a ladder toward better jobs and firms. This mobility is especially important for young workers, who in general move jobs often, and increasingly matters given the widening of earnings differentials across firms.[6]

At the same time, recessions impede worker mobility. For example, in the Great Recession, the voluntary quit rate fell by half. How does this reduced mobility impact career progression up the job ladder, and what are the consequences for workers?

John Haltiwanger, Henry Hyatt, Erika McEntarfer, and I explore whether workers tend to move up a firm job ladder and how any such progress is impacted by recessions.[7] Using employer-employee matched data in the U.S., we show that in good times, workers tend to move from low- to high-paying firms. However, this mobility slows in downturns. For example, in the Great Recession, movement away from the lowest-paying firms (bottom quintile) declined by 85 percent, with an associated 40 percent decline in earnings growth.

Our evidence is consistent with the poaching models of Giuseppe Moscarini and Fabien Postel-Vinay: During slack markets, when there is less competition for workers, firms at the bottom of the job ladder can more easily retain workers who ordinarily would have been poached away.[8] This means workers matching to jobs in recessions spend relatively more time at firms at the bottom of the job ladder before climbing up.

Earnings losses from a lack of upward mobility may be especially important and persistent for young workers, who typically change jobs often. Given that workers are much more likely to move up the job ladder during booms and that movements up the ladder are critical for earnings growth, our findings suggest that the cyclicality of the job ladder can have real consequences for workers' careers. These job mobility dynamics will be especially important for workers such as new labor market entrants who are forced to match to firms in recessions, for example.

Graduating into a Recession

How costly is it to graduate during a recession? In two papers, I explore the career impacts of graduating from college into an economic downturn. I show, using panel data on white men who graduated from college between 1979 and 1989, that graduating from college during a worse local or national economy has persistently negative impacts on wages.[9] Even 17 years after graduating from college, those who graduated into a large downturn earn significantly lower wages (around 10 percent less) relative to those who graduated in the best times.

In subsequent work, Joseph Altonji, Jamin Speer, and I examine the differential impact of entry conditions on career outcomes across college majors and how these effects changed over the period 1974–2011.[10] After a substantial data undertaking, involving piecing together seven datasets containing information on college major and labor market outcomes, we provide the most comprehensive analysis of U.S. data to date. Confirming my earlier work, we find large negative wage consequences to graduating into a downturn that persist many years into a career. Furthermore, we find that majors with typically higher earnings are somewhat sheltered, while majors that tend to earn less money suffer more from graduating into a recession.

These effects are illustrated in Figure 2, where we provide fitted earnings profiles for three types of college majors graduating into three different economies: Black lines represent high-earning majors with average pay 1.5 standard deviations above the mean (e.g., economics or electrical engineering); blue lines represent a major with average earnings (e.g., journalism or civic studies); gray lines represent low-earning majors with average pay 1.5 standard deviations below the mean (e.g., secondary education or art history). The solid lines show earnings for someone who graduated in an average economy; the dashed lines fit earnings for someone who graduated in a boom (a 4 percentage point below-average unemployment rate); the dotted lines show earnings for someone who graduated in a bust (a 4 percentage point above-average unemployment rate).

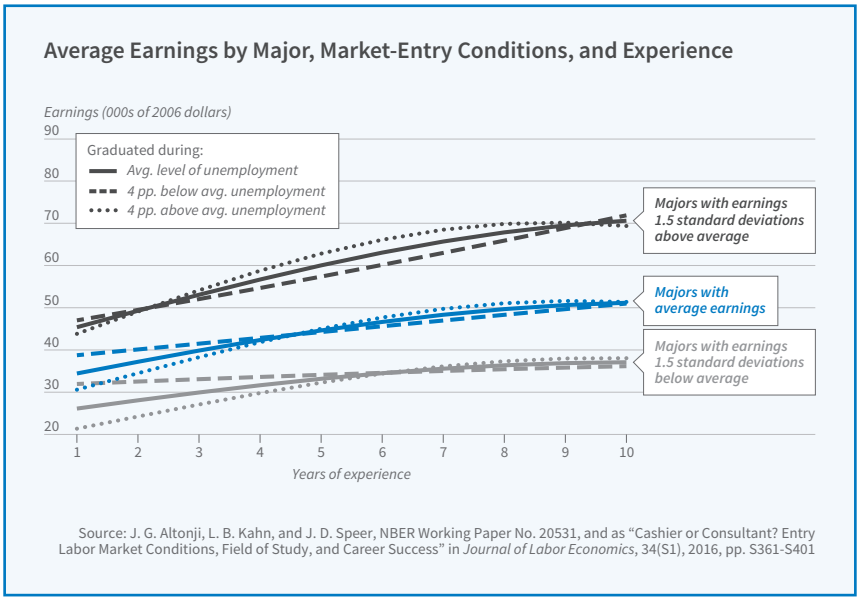


Figure 2

This figure shows several important patterns. First, the differences in earnings across majors are large and widen with experience. Second, entry conditions matter. At one year of potential experience, one can easily see the gap in earnings across boom and bust cohorts within major. The gap is largest for the low-return majors (gray lines). Correspondingly, the time it takes to overcome this gap is longest for the low-return major. We find that busts tend to widen inequality, pushing workers away from the mean, while booms tend to narrow inequality. Thus, a high-return major graduating in a bust widens his or her advantage over the average major, while a low-return major graduating in a boom narrows his or her disadvantage.

This research highlights that recessions have surprisingly long-lasting consequences for new entrants. Evidence discussed above on the cyclicality of the job ladder can help to account for these findings, since it implies that workers who are forced to search for and take jobs in a downturn may spend substantially more time in low-paying firms. Furthermore, weathering and recovering from a recession will be all the more difficult for workers laid off from routine-task occupations because of the concentrated technological adoption that I show took place in the Great Recession.

---

[1] *D. Acemoglu and D. Autor, "Skills, Tasks and Technologies: Implications for Employment and Earnings," NBER Working Paper No. 16082, June 2010, and* Handbook of Labor Economics,

4(B), 2011, pp. 1043–171.
Return to Text

2 *J. Schumpeter,* Business Cycles, *New York and London: McGraw-Hill, 1939.*
Return to Text

3 *N. Jaimovich and H. Siu, "Job Polarization and Jobless Recovery," NBER Working Paper No. 18334, November 2018,* and forthcoming The Review of Economics and Statistics.
Return to Text

4 *B. Hershbein and L. Kahn, "Do Recessions Accelerate Routine-Biased Technological Change? Evidence from Vacancy Postings," NBER Working Paper No. 22762, September 2017, and* The American Economic Review, *108(7), 2018, pp. 1737–72.*
Return to Text

5 *D. Deming and L. Kahn, "Skill Requirements across Firms and Labor Markets: Evidence from Job Postings for Professionals," NBER Working Paper No. 23328, May 2017, and* Journal of Labor Economics, *36(S1), 2018, pp. S337–69.*
Return to Text

6 *R. Topel and M. Ward, "Job Mobility and the Careers of Young Men," NBER Working Paper No. 2649, July 1988, and* Quarterly Journal of Economics, *107, 1992, pp. 441–79; D. Card, J. Heining, and P. Kline, "Workplace Heterogeneity and the Rise of West German Wage Inequality," NBER Working Paper No. 18522, November 2012, and The* Quarterly Journal of Economics, *128(3), 2013, pp. 967–1015.*
Return to Text

7 *J. Haltiwanger, H. Hyatt, L. Kahn, and E. McEntarfer, "Cyclical Job Ladders by Firm Size and Firm Wage," NBER Working Paper No. 23485, June 2017, and* American Economic Journal: Macroeconomics, *10(2), 2018, pp. 52–85.*
Return to Text

8 *G. Moscarini and F. Postel-Vinay, "The Timing of Labor Market Expansions: New Facts and a New Hypothesis," in* NBER Macroeconomics Annual 2008, *pp. 1–52; G. Moscarini and F. Postel-Vinay, "Stochastic Search Equilibrium,"* Review of Economic Studies, *80(4), 2013, pp. 1545–81.*
Return to Text

9 *L. Kahn, "The Long-Term Labor Market Consequences of Graduating from College in a Bad Economy,"* Labour Economics, *17(2), 2010, pp. 303–16.*
Return to Text

10 *J. Altonji, L. Kahn, and J. Speer, "Cashier or Consultant? Entry Labor Market Conditions, Field of Study, and Career Success," NBER Working Paper No. 20531, September 2014, and* Journal of Labor Economics, *34(S1), 2016, pp. S361–401.*
Return to Text

Population Aging, Retirement Income Security, and Asset Markets in China

Hanming Fang

Among the many challenges facing the Chinese economy, population aging is no doubt one of the most important. The old-age dependency ratio in China increased from 10 percent in 2000 to 13 percent in 2015, and is expected to increase to 44 percent by 2050 [Figure 1]. Both increasing life expectancy and declining fertility contributed to China's rapid population aging. Family planning policies, including but not restricted to the one-child policy, have led to a rapid decline in total fertility, from 5.7 in 1969 to 2.7 in 1978, when the one-child policy started, to about 1.6 currently [Figure 2, on the next page]. According to World Bank data, the average life expectancy at birth in China has steadily increased from 57.6 years in 1969 to 65.9 in 1978 to 76.4 in 2017.

Population aging has important implications for China's social insurance programs, retirement income security, and asset markets, including the housing market. In a series of papers, my coauthors and I have studied the impact of population aging in China from a variety of angles.

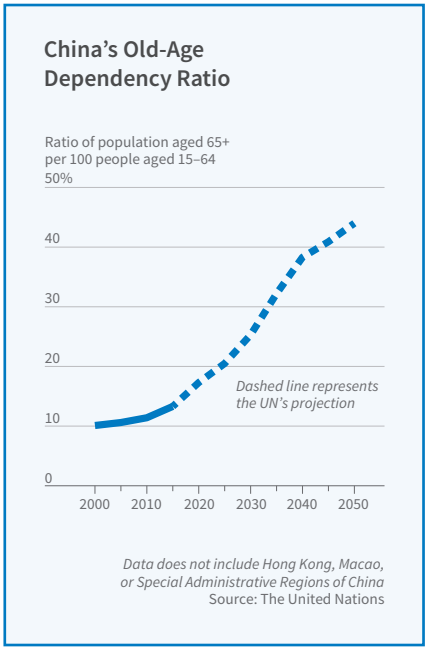


Figure 1

What is the current status of the Chinese pension system? To the extent that it is inadequate, what are the roles of alternative financial products such as reverse mortgages in providing retirement income for the elderly? What are the consequences of family planning policies on the physical and emotional well-being of the elderly? What are the impacts of population aging on asset markets? What are the likely impediments to and distributional consequences of policies that increase the retirement age?

It should be noted at the outset that population aging is a challenge that almost all industrialized nations face. The elderly face an amalgam of risks about income, health expenditure, long-term care expenditure, and mortality, and at the same time have more-limited income sources than their younger counterparts. In developed economies, the elderly rely on a mixture of self-savings, social insurance programs, and private insurance products to cope with these risks.[1] The population-aging challenge China faces is particularly acute for several reasons. First, the trend is accelerated by China's family planning policies since the early 1970s; second, the

Hanming Fang is the Class of 1965 Term Professor of Economics at the University of Pennsylvania. He is a research associate in the NBER Program on Public Economics, and served as acting director of the Chinese Economy Working Group from 2014 to 2016. He received a B.A. from Fudan University in Shanghai in 1993, an M.A. from the University of Virginia in 1995, and completed his Ph.D. in economics at the University of Pennsylvania in 2000.

Fang is a fellow of the Econometric Society. Before joining the Penn faculty, he held positions at Yale University (2000–07) and Duke University (2007–09). He is currently a senior editor of the *Journal of Risk and Insurance*, and was previously a co-editor of *Journal of Public Economics* and *International Economic Review*.

Fang is an applied microeconomist with broad theoretical and empirical interests. His research covers topics including discrimination, social economics, psychology and economics, welfare reform, health insurance markets, and population aging. His papers in these areas have been published in several leading journals, including *American Economic Review*, *Journal of Political Economy*, and *International Economic Review*. His recent research on China focuses on issues related to population aging, social security, and housing market.

Fang grew up on the beautiful Zhoushan Islands, in the East China Sea, of Zhejiang Province. He now lives in a Philadelphia suburb with his wife, Yufeng, and two children: Jerry who will be a college freshman, and Katie who will be a high-school freshman. He enjoys reading and gardening.

current social insurance system in China tends to have low and unequal benefit levels; and third, the private insurance markets for the risks the elderly face are not yet well developed.

Family Planning Policies and the Life of the Chinese Elderly

Family planning policies introduced in the early 1970s in China contributed to the population-aging challenges China faces today. It is therefore important to examine how these policies have reshaped the quality of life, including the physical and mental well-being of the Chinese elderly.[2] In an effort to curb population growth, China implemented its one child per couple policy nationwide from 1979 to 2015; somewhat less known, however, was the "Later, Longer, Fewer" (LLF) campaign also initiated in the early 1970s. In fact, it was the LLF campaign that started the rapid decline of China's total fertility rate from 5.7 in 1969 to 2.7 in 1978 [Figure 2].[3]

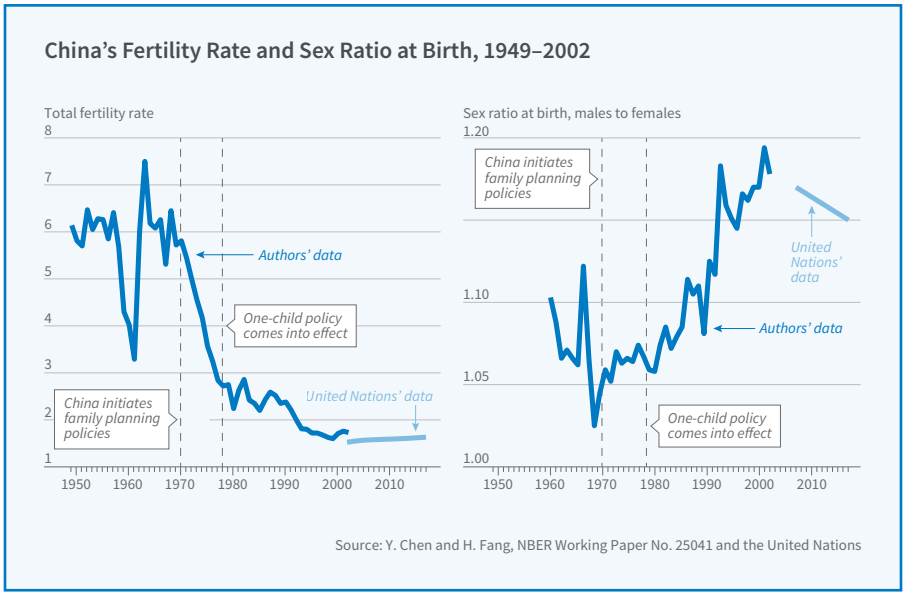


Figure 2

LLF campaigns offer a valuable opportunity to study how family planning policies affect the life of the Chinese elderly for three reasons. First, in contrast to the one-child policy, the rollout of LLF varied across provinces. Second, LLF policies during the 1970s explain about half of the decline in the fertility rate but, in contrast to the one-child policy, they did not result in an increase in the sex ratio [Figure 2]. Third, the first cohorts affected by LLF are now entering their 60s. Yi Chen and I identify the causal effect of LLF policies from two types of province-level variations. The first is different years for the establishment of Provincial Family Planning Leading Groups, which were in charge of LLF implementation at the provincial level. The second is different profiles of the age-specific fertility rate in 1969 prior to the enforcement of any effective family planning policy.

How family planning affects the quality of life in old age in China is ambiguous. While children historically play critical roles in providing old-age support, the reduction in the number of children does not necessarily reduce the quality of life for seniors, for three reasons. First, having fewer children spares resources that could be redirected to parents themselves. Second, parents can potentially turn to other measures of old-age support — for example, more savings — to substitute for having fewer children. Third, a quantity-quality tradeoff may result in higher transfers from fewer children.

We use data from the China Health and Retirement Longitudinal Study (CHARLS) to examine the long-term consequences of China's family planning policy on a set of outcomes including support from children, consumption, and physical and mental health, for those aged 60 or above.

On children's support for their parents, we consider measures of co-residence, financial or in-kind support, and time transfer, or informal care. Regarding living arrangements, we find no evidence that family planning affects households' decisions regarding co-residency. However, the family planning policies reduce the probability of seniors having children in their village or community by 8.8 percentage points and of having children in their county/district by 7.6 percentage points. The LLF policies also reduce elderly parents' net annual transfers from children by 395.9 RMB (about 18.6 percent of the sample average) and are associated with reduction of children's monthly contacts and visits to parents by 3.08 and 3.00 times per month, respectively.

Despite reduced financial support from children, we find no effect on total household expenditures, though we find evidence that family planning affects the composition of expenditures: Households that are more exposed to LLF policies spend more on food and living expenses and less on health-related expenses.

The most important finding is that family planning has drastically different effects on elderly parents' physical and mental well-being. Using a wide range of health measures, either subjective or objective, we find that family planning has either no effect or a slightly positive effect on elderly parents' physical health status. In contrast, parents who are more exposed to the policies report more severe depression symptoms. The effect is larger for women and rural parents. Three depression symptoms that are most responsive to the policies are: "feel everything they are doing is an effort," "feel lonely," and "feel unhappy." We hypothesize that less interaction with children is an important driving force for these effects.

The Chinese Pension System

In a survey paper, Jin Feng and I provide a detailed account of the current state of the Chinese pension system, as well as its historical development.[4]

China's pension system is multi-layered. The first layer consists of several public pension programs. Some are mandatory, including Basic Old Age Insurance (BOAI) for employees in for-profit enterprises and Public Employee Pension (PEP) for civil servants and employees in nonprofit government institutions. Some are voluntary, including Urban Resident Pension (URP) and New Rural Resident Pension (NRP), respectively, for urban and rural residents aged 16 and older without a formal non-agricultural job. These pension plans aim to provide basic social security to all residents when they reach old age, regardless of whether they were employed. The second layer consists of employer-sponsored annuity programs, which employers voluntarily provide as a supplement to the public pension programs. The third layer consists of household savings-based annuity insurance policies. First-layer public pension schemes receive substantial direct subsidies from the government, and all plans or products receive tax preferences.

URP and NRP were merged into a uniform Resident Pension system in 2014; PEP was merged into BOAI in 2015, making BOAI the uniform program for all employees in urban sectors. As of the end of 2017, BOAI had 402.9 million participants, of which about 37 million were public sector employees, and the Resident Pension plan had 512.6 million participants. The public pension plans covered 65.8 percent of China's total population, with a total public pension expenditure of 4.032 trillion RMB, about 5 percent of China's GDP. Participation in the second layer was much more limited. Only about 80,000 firms, accounting for less than 0.5 percent of all firms, offered employer-sponsored annuity programs to 23.3 million employees in 2017. The third layer is still in its infancy.

These are the key characteristics of the Chinese pension system:

- The in-system dependency ratio of China's Basic Old Age Insurance system (the ratio of beneficiaries to contributors to the system) is about 38 percent, much higher than the population-wide dependency ratio of 26 percent in 2017. The in-system dependency ratio of the Resident Pension scheme was 43 percent in 2016.

- China has one of the highest statutory pension contribution rates in the world at 28 percent, with 20 percent contribution by the employer, and 8 percent contribution by the employee into a notional individual account with a notional interest rate that currently stands at 8.31 percent.

- The average benefit replacement ratio — pension benefits per pensioner as a percentage of the average wage of workers — has declined steadily and stood at 46 percent in 2017.

- Current retirement ages are 60 for men, 50 for women who work in blue-collar jobs, and 55 for women who work in white-collar jobs. About 93 percent of women are required to retire at age 50.

- This is a fragmented system managed by local governments. Some provinces pool the funds at the provincial level, but most funds are pooled at the city or county level.

- Despite the high statutory contribution rate, the BOAI would have run a fiscal deficit in almost half of the provinces in the absence of government subsidies in 2016.

The Chinese pension system faces many challenges, including weak participation incentives, regional as well as urban/rural disparity in benefits, low benefits, and fiscal unsustainability. Various pension reform proposals are being discussed. One obvious proposal is to raise retirement ages. In ongoing research projects, my coauthors and I examine two issues related to this proposal. First, we study its distributional consequences, recognizing that life expectancy differs significantly between blue-collar and white-collar workers. Second, we critically evaluate the presumption that the elderly would be able to find employment if retirement ages were raised, focusing on the potential labor rationing of elderly workers caused by rapid cohort-to-cohort productivity growth and mechanisms for wage compressions.

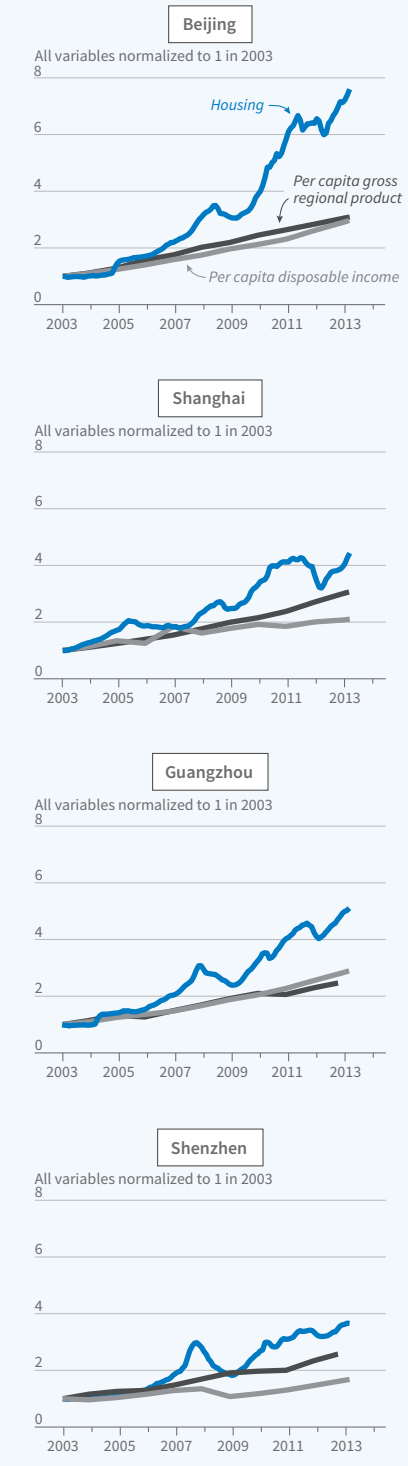


Figure 3

The Chinese Housing Market

Partly to pave the way for reform of state-owned enterprises (SOEs) prior to China's accession to World Trade Organization, and partly as a response to the adverse effects of the 1997 Asian financial crisis, the Chinese government in 1998 established the real estate sector as a new engine of economic growth. Residential mortgages at subsidized interest rates were introduced by China's central bank, the People's Bank of China (PBC), and between 1998 and 2002, the PBC lowered the mortgage interest rate five times to encourage home purchases. By 2005, China had become the largest residential mortgage market in Asia.

As housing becomes the most important asset for most Chinese households, home-equity release products can play an important role in providing retirement income for the Chinese elderly. To properly assess housing equity appreciation, one needs quality-controlled housing price indices for China.

Quanlin Gu, Wei Xiong, Li-An Zhou, and I undertake this exercise using a comprehensive dataset of mortgage loans issued by a major Chinese commercial bank from 2003–13.[5]

We construct housing price indices for 120 major cities in China, using a methodology that can be viewed as an analog of the well-known Case-Shiller index.[6] This index is based on comparison of repeat sales of the same homes, but due to the nascent nature of the Chinese market, there are relatively few repeat home sales in the country. However, an important feature of the Chinese housing market is that housing units are typically apartments in large developments; thus, apartment units in the same development that were sold at different months can be thought of the analog of Case-Shiller repeat sales, as the units share similar characteristics and amenities.

Our indices are more reliable than the two widely used official housing price series reported by the National Bureau of Statistics (NBS) of China: the NBS 70-City Index and the NBS Average Price Index. The 70-City Index is remarkably smooth and shows very little real housing price growth in the last decade, while the Average Price Index fails to control for quality, as it does not account for the fact that the newly transacted units in a city are gradually moving to its outer rings, an important factor in rapidly expanding Chinese cities.

Figures 3 and 4 plot our housing price indices for the four first-tier cities — Beijing, Shanghai, Guangzhou, and Shenzhen — which are the most populous and economically important metropolitan areas in China and the averages of 31 second- and 85 third-tier cities between 2003 and 2013. They confirm enormous housing price appreciation across China. In first-tier cities, housing prices had an average annual real growth rate of 13.1 percent during this decade. Housing prices in second- and third-tier cities had average annual real growth rates of 10.5 percent and 7.9 percent, respectively. These growth rates substantially surpass housing price appreciation during the U.S. housing bubble in the 2000s and are comparable to those during the Japanese housing bubble in the 1980s.

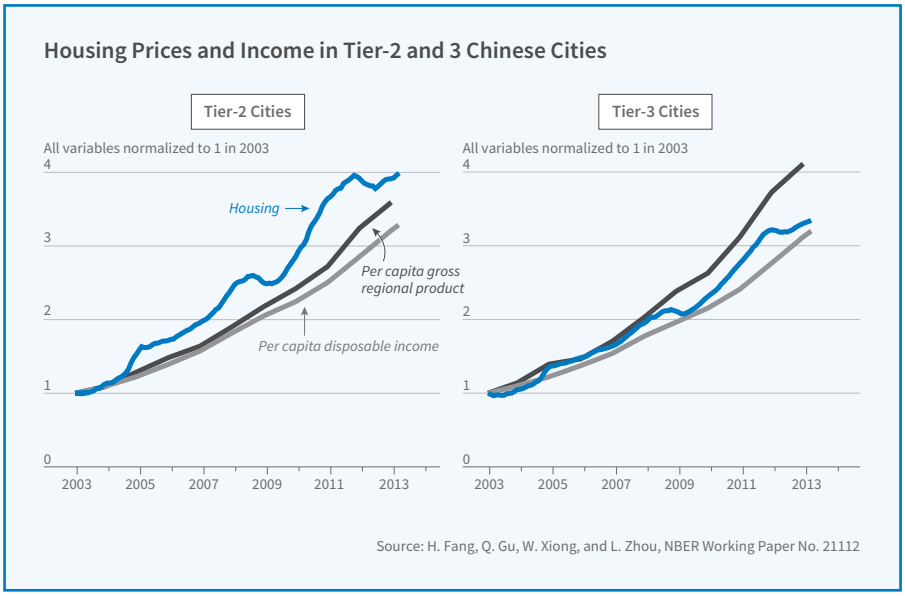


Figure 4

Figures 3 and 4 also show that, while rapid housing price appreciation often has been highlighted as a concern for the Chinese housing market, the price appreciation was accompanied by equally spectacular growth in households' disposable income (DI) and average gross regional product (GRP). The average annual real growth rate was about 9 percent throughout the country during the decade. Simultaneous enormous housing price appreciation and income growth did not occur during the U.S. and Japanese housing bubbles.

Reverse Mortgages as a Source of Insurance and Retirement Income?

China is under tremendous pressure to provide adequate financial resources for its rapidly growing elderly population. Besides considering reform and expansion of the Chinese pension system, private insurance markets also could play an important part in risk mitigation.

Chinese households hold a large proportion of their wealth in the form of housing. Large increases in house prices have led to large increases in household wealth.[7] In contrast, other predominant investment vehicles available to the Chinese have had low returns in this period. The real one-year bank deposit rate averaged only 0.01 percent in 2003-2013; the Chinese stock market was still relatively small, with a capitalization of slightly less than 20 trillion RMB in 2013, and the returns were volatile and much lower than those in the housing market. The bond market was even smaller.

Recent surveys find that homeownership rates are high in China, and housing is the largest component of household wealth. In the 2011 CHARLS national baseline, 88 percent of urban residents and 92 percent of rural residents aged 45 or older lived in households owning at least one property. Similarly, the 2012 China Household Finance Survey found that home ownership

rates were 88.1 percent and 94.7 percent, respectively, for urban and rural households.[8] Housing equity comprised 79–85 percent of total wealth for urban residents and 61–74 percent for rural residents in various surveys. Home ownership rates and housing equity are even higher among older residents. Both the homeownership rate and the fraction of housing in household wealth in China are significantly higher than those in the United States.

How can the elderly access their housing wealth to provide retirement income? Reverse mortgages allow homeowners to borrow against their home without having to make repayments while they still live there. Once the homeowner dies or permanently moves into a nursing home, the home is sold, and the sale proceeds are used to repay the loan.

In 2014, the Chinese government authorized a pilot program to introduce reverse mortgages in China. These loans were initially offered by Happy Life Insurance in four cities for two years. Happy Life now offers reverse mortgages in eight cities: Beijing, Shanghai, Guangzhou, Wuhan, Hangzhou, Dalian, Nanjing, and Suzhou. However, so far the demand for the product has been low: only 139 contracts were underwritten by mid-2018. The reverse mortgage product offered by Happy Life is very complex and inflexible, and the product description is hard to understand.

Katja Hanewald, Hazel Bateman, Shang Wu, and I investigate whether there would be a demand for properly designed and clearly explained reverse mortgages in China.[9] We test an improved, more flexible reverse mortgage product design that addresses some of the shortcomings of the unpopular product piloted by Happy Life.

The key innovation of our study is the product design and product description. Our hypothetical product allows borrowers to choose the level of debt as well as the type of payment that best suits their retirement needs. Possible payment types include a lump sum, lifetime fixed regular payments, or flexible payments. In addition, our product explicitly allows the borrowers' heirs to settle the outstanding debt and keep the property at the end of the contract, if they prefer. We also take special care to address potential purchasers' concerns about how house sales will be conducted, whether rental is permitted, and how a loss of the property will be handled. In addition, we make sure to test the subjects' understanding of our reverse mortgage product, which has a simpler debt structure and lower fees than the reverse mortgage offered by Happy Life. We test the demand for this product in two large online surveys, one targeting homeowners aged 45–65 as potential purchasers and the other targeting adult children aged 20–49 who represented the children of potential purchasers. Each survey has 1,100 participants.

We find a high level of interest in reverse mortgages both among older homeowners and the adult children of older homeowners. This result contradicts some widely held perceptions of intergenerational wealth transfer in China. Survey participants want to use the reverse mortgage payments for a range of purposes. Funding a more comfortable retirement and paying for better medical treatments or aged care services are the most important reasons given for interest in the product by both older homeowners and adult children. Consistent with previous literature, we find that product familiarity and product understanding are associated with higher interest in the product. We are currently examining the demand for hybrid reverse mortgage products bundled with long-term care and/or health insurance.

---

[1] *H. Fang, "Insurance Markets for the Elderly," NBER Working Paper No. 20549, October 2014,* and published in *J. Piggott and A. Woodland, eds.,* Handbook of Economics of Population Aging, *Vol. 1A, Amsterdam, The Netherlands, Elsevier/North Holland Press, 2016, pp. 237–309.*
Return to Text

[2] *Y. Chen and H. Fang, "The Long-Term Consequences of Having Fewer Children in Old Age: Evidence from China's 'Later, Longer, Fewer' Campaign," NBER Working Paper No. 25041, September 2018.*
Return to Text

[3] *K. Babiarz, P. Ma, G. Miller, and S. Song, "The Limits (and Human Costs) of Population Policy: Fertility Decline and Sex Selection in China under Mao," NBER Working Paper No. 25130, October 2018,* also studied the impact of LLF campaigns on fertility and sex selection.
Return to Text

[4] *H. Fang and J. Feng, "The Chinese Pension System," NBER Working Paper No. 25088, September 2018,* and forthcoming in *M. Armstad, G. Sun, and W. Xiong,* Handbook on Chinese Financial Markets, *Princeton University Press.*
Return to Text

[5] *H. Fang, Q. Gu, W. Xiong, and L. Zhou, "Demystifying the Chinese Housing Boom," NBER Working Paper No. 21112, April 2015, and the* NBER Macroeconomics Annual, *2015, pp. 105–66.* We also answer the following questions: Did the soaring prices make housing out of the reach of typical households? How much financial burden did households face in buying homes?
Return to Text

[6] *K. Case and R. Shiller, "Prices of Single-Family Homes Since1970: New Indexes for Four Cities,"* New England Economic Review, *1, 1987, pp. 45–56.*
Return to Text

[7] *Ibid, NBER Working Paper No. 21112.*
Return to Text

[8] *A. Park and Y. Shen, "Understanding wealth and housing inequality among China's older population,"* China Economic Journal, *8(3), 2015, pp. 288–307; L. Gan, Z. Yin, N. Jia, S. Xu, S. Ma, and L. Zheng, Data You Need to Know About China: Research Report of China Household Finance Survey (2012), Berlin: Springer-Verlag, 2014; and Y. Xie and Y. Jin, "Household Wealth in China,"* Chinese Sociological Review, *47(3), 2015, pp. 203–29.*
Return to Text

[9] *K. Hanewald, H. Bateman, H. Fang, and S. Wu, "Is There a Demand for Reverse Mortgages in China? Evidence from Two Online Surveys," NBER Working Paper No. 25491, January 2019.*
Return to Text

The Sustainable Investing Proposition

Harrison Hong

In a recent, widely covered press release, Larry Fink, chief executive of the world's largest asset management company, BlackRock, pledged significant resources toward developing sustainable investing, for example by offering funds that invest using environmental, social, and governance (ESG) criteria along with other considerations to make asset allocation decisions.[1] Fink said he views sustainable investing as being in its early stages. The thinking goes that investors worried about climate change increasingly want portfolios of companies that are consistent with their values — much in the way that an earlier generation embraced ethical investing or divestment-from-sin stocks. To the extent that markets are too short-termist to confront long-run risks, high ESG stocks might have high risk-adjusted returns. Depending on how large these excess returns are, a fund portfolio tilted toward high ESG stocks might outperform, or at least not underperform, passive indices. This is what I label the "sustainable investing proposition."

This proposition is controversial among academics and practitioners. Since ESG funds typically have higher fees (due to the costs of in-house research or licensing third-party sustainability scores) and tracking error (since the mandate often requires tilting away from large market capitalization stocks), it is far from a foregone conclusion that ESG scores contain enough expected return information to overcome these initial drags on performance. Indeed, the performance of funds currently using sustainability scores generated by leading ESG ratings agencies is mixed.

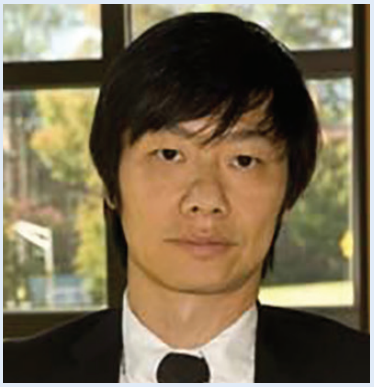
Academic studies have found similarly divergent results on whether picking stocks with better environmental, social, and good-governance criteria have higher, comparable, or lower average returns than asset allocations that ignore these considerations. A critical question in evaluating *ex post* performance is whether the differential returns of allocation strategies that include ESG considerations are attributable to ESG factors, or whether measures of ESG ranking are capturing other firm characteristics that are correlated with ESG scores.

In research with several coauthors over the last decade, I have investigated the validity of a number of key premises underlying the sustainable investing proposition. We use in our analysis ESG measures, produced by MSCI KLD, which rank firms based on product, environment, community, diversity, and governance criteria. MSCI is a global provider of equity and fixed income indices and MSCI KLD is one of the most widely used ESG scores by institutional investors and academics. Our analysis focuses on data for S&P 500 firms over the period 1991 through 2009.

Direct versus Selection Effects

A key premise of sustainable investing is that firms "do well by doing good." This implies that a firm's ranking on ESG criteria has a causal effect on its financial performance, for example by lowering its cost of capital. But to what extent do firm sustainability scores simply reflect potential selection effects, whereby successful firms are more likely to be socially responsible for a variety of other reasons? For instance, firms that have easy access to capital markets might have less leverage in bargaining with labor, and thereby be more likely to fund pensions and have higher ESG scores as a result. In this case, there might be no causal impact of ESG on firms' cost of capital per se, but investors in sustainable companies might inadvertently be exposed to firms with lower costs of capital — those with higher stock valuations and lower expected returns. While such a correlation of firm characteristics might lead to stronger performance of firms with strong ESG scores in some periods, the reason would not be the one associated with the sustainable investment proposition.

Jeffrey Kubik, José Scheinkman, and I show that these selection effects are likely



Harrison Hong is a research associate in the NBER's Asset Pricing Program. He is currently the John R. Eckel Jr. Professor of Financial Economics in the Columbia University Department of Economics, where he teaches courses in the undergraduate and Ph.D. programs. Before coming to Columbia in 2016, he was on the economics faculty of Princeton University, most recently as the John Scully '66 Professor of Economics and Finance. Prior to that, he was an assistant professor of finance at the Stanford Graduate School of Business from 1997–2001.

Hong received his B.A. in economics and statistics with highest distinction from the University of California, Berkeley in 1992 and his Ph.D. in economics from M.I.T. in 1997.

He has contributed to a number of topics in financial economics, especially on behavioral finance and stock market efficiency. In 2009, he was awarded the Fischer Black Prize, given every two years by the American Finance Association to the best finance economist under the age of 40. He has received several honorary doctorates. He lives with his wife and son in New York City.

to be larger than the direct effects of ESG.[2] To see why, in Figure 1 we plot the average ESG scores of two groups of firms — investment-grade versus noninvestment-grade or junk firms over the years of 1991 to 2009. The ESG scores are normalized to account for industry differences. The scores of investment-grade firms are almost always higher than those of junk firms. There are two ways to interpret this cross-sectional relationship. The first is that ESG causally leads to better ratings or lower cost of capital. The other is reverse-causality — that firms with better ratings just happen to also be socially responsible.

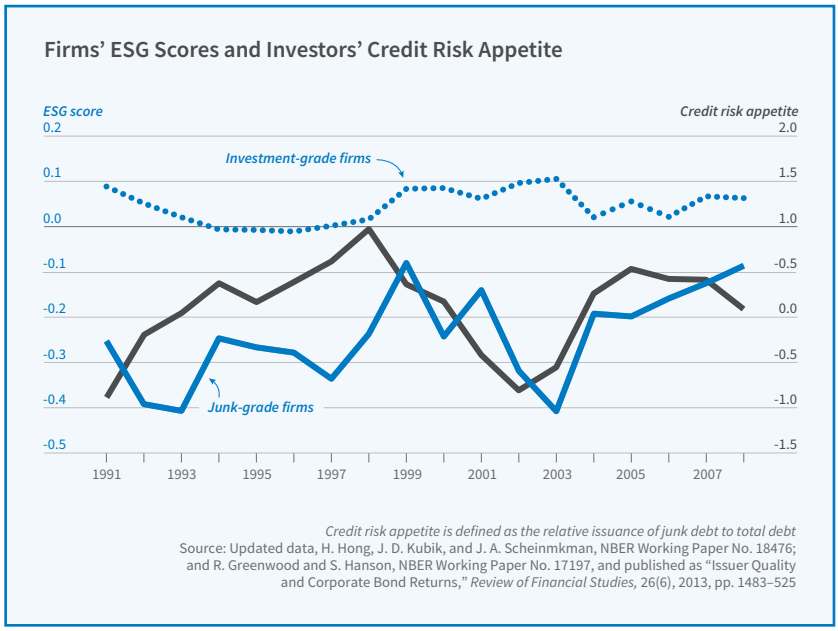


Figure 1

To gauge which channel is larger, we also plot in Figure 1 a measure of credit risk appetite developed by Robin Greenwood and Samuel Hanson that is defined as the relative issuance of junk debt to total debt.[3] The idea is that junk firms are much more sensitive to common shocks in risk appetite, whether rational or behavioral in nature, than investment-grade firms. They show that junk debt relative to total debt issuance is a good measure of this common or macroeconomic time-varying risk appetite.

Notice that the ESG scores of the junk firms strongly track this credit risk appetite measure. Even though individual firm normalized ESG scores cannot causally influence aggregate credit risk appetites, they nonetheless strongly co-move with this appetite measure, thereby pointing to selection effects largely driving ESG scores. Indeed, if ESG scores have a large direct effect on a firm's rating or access to credit, we would expect average corporate ESG scores to fall as credit risk appetite in the macroeconomy rises. This is because the marginal return to additional corporate actions to improve ESG scores, and thereby lower the cost of capital, is likely to be smaller when the firm already has access to finance, as is likely when risk appetite is high.

Pecuniary versus Non-Pecuniary Motives

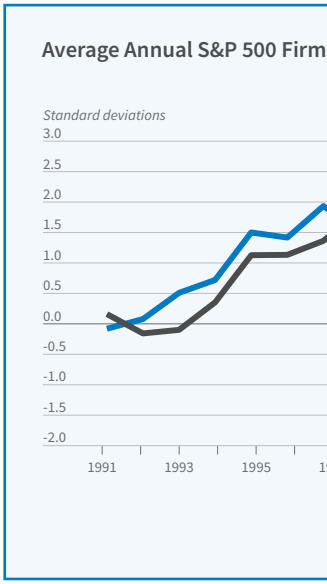
Another key premise of sustainable investing is that sustainability scores capture strategic positioning of firms to address long-run risks; that is, motives for corporate actions that raise ESG scores are profit-driven, just like investments in plant and equipment or advertising. There are also non-pecuniary factors that contribute to variation in the behaviors that affect firms' ESG ratings. Corporate taxes, for example, can influence the incentives for firms to make charitable contributions; agency issues can also be important. Since sustainability scores cannot distinguish between pecuniary and non-pecuniary motives for ESG investment by firms, the link between sustainable corporate behaviors and subsequent performance is likely to be more tenuous if non-pecuniary motives account for a substantial part of the variation in ESG scores.

Using two quasi-experiments, Ing-Haw Cheng, Kelly Shue, and I show that firm sustainability scores are significantly influenced by non-pecuniary motives for corporate actions.[4] The first experiment is provided by the 2003 reduction in shareholder dividend taxes in the United States.

Theories of the effect of dividend taxes on firm investments predict that tax cuts should lead to positive or at least nonnegative effects on investments. See, for example, work by James Poterba and Lawrence Summers.[5] To the extent ESG spending is profit-driven or pecuniary in nature, as a form of investment or as an offset to firm production as in pollution-abatement models, we expect firm sustainability scores should track firm capital expenditures and that the dividend tax cut should have had positive or at least nonnegative effects on firm ESG scores.

In Figure 2, we see that average firm sustainability scores, which tracked average firm capital expenditure before the 2003 dividend tax cut, diverge substantially afterward. The tax cut occurs at around the same time as the recovery from the early 2000s recession. Capital investments naturally rebound but ESG scores actually decline significantly after the tax cut, inconsistent with the pecuniary motive. This decline in ESG scores occurs over a period when ESG is receiving increasingly more, not less, attention from media, investors, and regulators.

This negative association of the tax cut with ESG is, however, consistent with a non-pecuniary, tax-motivated delegated giving channel. Assuming that shareholders take the standard tax deduction and do not itemize deductions for charitable giving, which is the case for many employees of firms, those who want to support sustainable causes might be able to do so in a



more tax-efficient manner if the firm makes a charitable gift and reduces their dividend payouts than if the firm pays a dividend and the individual makes a gift. A cut in dividend taxes hence increases the relative price of giving inside versus outside the firm, and can explain why firm ESG scores fall subsequent to the tax cut.

To the extent such giving decisions are delegated to managers, agency problems can then naturally arise, and firms with high ESG scores might be expected to underperform rather than outperform low ESG scores. To address such an agency motive, we exploit a regression discontinuity (RD) experiment using close proxy contests regarding shareholder-initiated governance proposals. The identifying assumption is that close votes around the 50 percent cut-off are random in terms of whether a governance proposal is passed, and represent plausibly exogenous shocks to corporate governance. Vincente Cuñat, Mireia Giné, and Maria Guadalupe find that close passage of shareholder proposals increases firm value by about 2 percent.[6]

We find that firms in which shareholder proposals narrowly pass also experience significantly slower growth in goodness scores than firms in which the proposals narrowly fail, consistent with some ESG investments being value-reducing and motivated by agency problems.

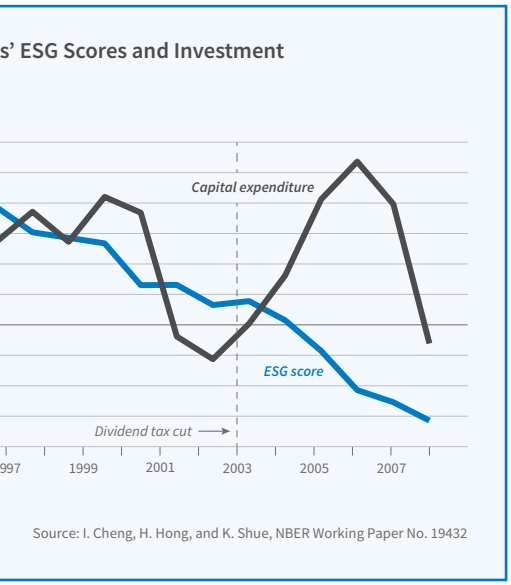


Figure 2

The Past versus the Future of Sustainable Investing

Finally, while my papers raise challenges to the sustainable-investing proposition, it is important to keep in mind that my research and many other studies of related questions use data from a period when sustainability issues were arguably less important than they are likely to be going forward. This addresses a third key premise of sustainable investing: The risks to sustainability are large. In other words, the historical importance of considering a firm's positioning regarding sustainability risks, as measured by ESG scores, may have been small, because such risks might have been small in the past. If, indeed, regulation will likely be tighter and the climate risks to capital markets greater, then the direct effects of firm sustainability might become larger and the sustainable-investment proposition more convincing in the future.

To this end, my work with Jeffrey Kubik, Inessa Liskovich, and Scheinkman estimates the value of ESG for bargaining settlements of the Foreign Corrupt Practices Act (FCPA).[7] The FCPA penalizes parent firms headquartered in the U.S. for bribery crimes committed by employees located at foreign subsidiaries. Bribery and consequent FCPA penalties are a significant corporate risk that can amount to billions of dollars. That is, firms that have been affected by FCPA cases are firms for which sustainability issues had a first-order effect on near-term profits, and the affected firms may provide some foreshadowing on the role of ESG considerations for many firms going forward. We therefore focus on the effect of ESG ranking on the settlements exacted from these firms, which translate directly into shareholder returns.

Virtually all cases are settled via bargaining between the parent company and prosecutors from the Department of Justice and/or the Securities and Exchange Commission. Settlements are publicly announced and reveal detailed case data not only on sanctions, but also on revenues obtained from bribes. We expect high ESG parent firms to receive lower sanctions as a fraction of the size of the bribery revenues, the reason being that firms with good ESG scores are more likely to be treated favorably by juries (i.e., a halo effect) should bargaining fail and their cases go to trial. They might also be more cooperative with prosecutors, thereby reducing the costs of investigations.

Figure 3 plots the relationship between the natural logarithm of sanctions on the *y* axis and natural log of the bribery revenues on the *x* axis. We see a very pronounced linear and upward sloping relationship between sanctions and illicit revenues, as we would expect from FCPA sentencing guidelines. We also plot observations for low ESG firms (bottom quartile of scores) and high ESG firms (top quartile of scores). High ESG firms are more likely to be below the prediction line, while low ESG firms are much more likely to be above the prediction line. A one standard deviation increase in the independent variable ESG score leads to a decrease in the dependent variable log sanction to bribery revenue ratio that is nearly 20 percent of the standard deviation of the dependent variable.

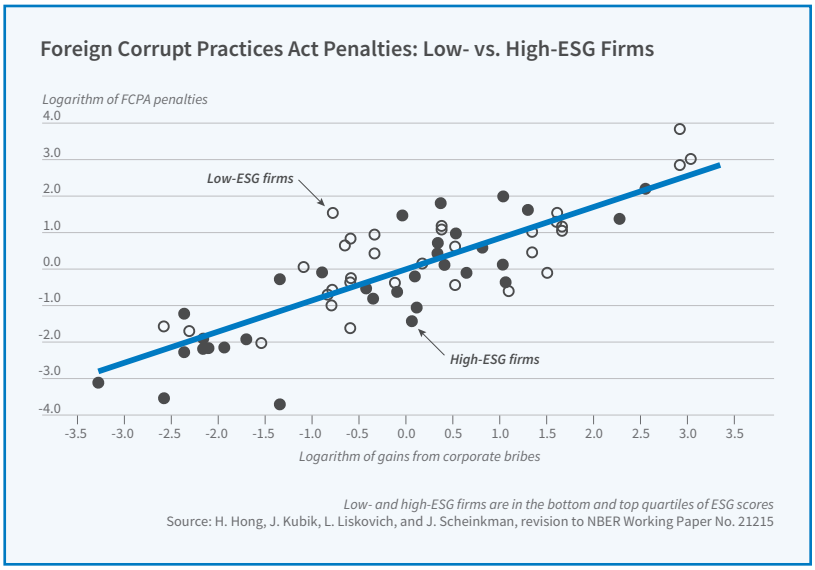


Figure 3

The main omitted-variables concern is that the subsidiaries of high ESG firms for whatever reason commit less egregious foreign bribes that are not completely captured by case data. To this end, we instrument firm sustainability scores using the length of the legal code of the state where the firm is headquartered, which is measured in kilobytes and developed by Casey Mulligan and Andrei Shleifer.[8] The exclusion restriction is that the egregiousness of bribes by employees at foreign subsidiaries is uncorrelated with this state-level regulation measure. Consistent with this exclusion restriction, kilobytes of state law is uncorrelated with bribery revenues or bribe length. But it is strongly correlated with firms' ESG scores, giving us a first-stage regression. Instrumental variables estimates are twice as big as the ordinary least squares ones.

Another important consideration is that climate-change risks will be more manifest in the future. As a result, sustainable investing might evolve from studying these coarse scores to modeling the exposure of firms to such risks, be it exposure to carbon or to natural disasters. In work with Weikai Li and Jiangmin Xu, I demonstrate the value of this alternative approach by studying whether prices of food stocks efficiently discount climate-change risks.[9] In a world with greater regulatory scrutiny or greater climate change risks, a sustainable-investing approach that is robust to these concerns might deliver value to investors.

---

1 *A. Mooney and P. Smith, "As the climate changes, ESG investing powers into the mainstream,";* Financial Times, *Nov. 18, 2018.*
Return to Text

2 *H. Hong, J. Kubik, and J. Scheinkman, "Financial Constraints on Corporate Goodness," NBER Working Paper No. 18476, October 2012.*
Return to Text

3 *R. Greenwood and S. Hanson, "Issuer Quality and the Credit Cycle," NBER Working Paper No. 17197, July 2011,* and published as *"Issuer Quality and Corporate Bond Returns,"* The Review of Financial Studies, *26(6), 2013, pp. 1483–525.*
Return to Text

4 *I. Cheng, H. Hong, and K. Shue, "Do Managers Do Good with Other People's Money?" NBER Working Paper No. 19432, September 2013.*
Return to Text

5 *J. Poterba and L. Summers, "The Economic Effects of Dividend Taxation," NBER Working Paper No. 1353, May 1984.*
Return to Text

6 *V. Cuñat, M. Giné, and M. Guadalupe, "The Vote is Cast: The Effect of Corporate Governance on Shareholder Value," NBER Working Paper No. 16574, December 2010.*
Return to Text

7 *H. Hong and I. Liskovich, "Crime, Punishment and the Halo Effect of Corporate Social Responsibility," NBER Working Paper No. 21215, May 2015.* The plot and analysis are from an upcoming revision to this paper that is joint with Jeffrey Kubik and José Scheinkman.
Return to Text

8 *C. Mulligan and A. Shleifer, "Population and Regulation," NBER Working Paper No. 10234, January 2004.* Published as *"The Extent of the Market and the Supply of Regulation,"* Quarterly Journal of Economics, *120 (4), 2005, pp. 1445–73.*
Return to Text

9 *H. Hong, W. Li, and J. Xu, "Climate Risks and Market Efficiency," NBER Working Paper No. 22890, December 2016, and* Journal of Econometrics, *208 (1), 2019, pp. 265–81.*
Return to Text

The Economics of Fair Trade

Nathan Nunn

Nathan Nunn is Frederic E. Abbe Professor of Economics at Harvard University. His primary research interests are in political economy, economic history, economic develo´pment, cultural economics, and international trade. He is a research associate in the programs on Development of the American Economy, International Trade and Investment, Political Economy, and Development Economics. He also is a research fellow at BREAD, and a faculty associate at Harvard's Weatherhead Center for International Affairs. He is currently a co-editor of the *Journal of Development Economics*.

One stream of Nunn's research focuses on the historical and dynamic process of economic development. In particular, he has studied the factors that shape differences in the evolution of institutions and cultures across societies. He has published research that studies the historical process of a wide range of factors that are crucial for economic development, including distrust, gender norms, religiosity, norms of rule following, conflict, immigration, state formation, and support for democracy.

Another stream of Nunn's research examines economic development in a contemporary context. He has published research examining the effects of Fair Trade certification, CIA interventions during the Cold War, foreign aid, school construction, and trade policy. He is particularly interested in the importance of the local context (e.g., social structures, traditions, and cultures) for the effectiveness of development policy and in understanding how policy can be optimally designed given the local environment.

Nunn lives in Cambridge, Massachusetts, and enjoys playing basketball and surfing.

Fair Trade certification, a labeling initiative that offers better terms to producers and helps them to organize, aims to offer ethically minded consumers the opportunity to help lift producers in developing countries out of poverty. In a series of recent papers, I have examined the causes and consequences of Fair Trade certification.[1]

The appeal of this initiative is reflected in the impressive growth of Fair Trade-certified imports over the past two decades. Since Fair Trade's inception in 1997, sales of its certified products have grown exponentially. In 2016, when data are last available, there were over 1,400 Fair Trade-certified producer organizations worldwide representing more than 1.6 million Fair Trade-certified farmers and workers in 73 countries across 19 product categories.

This growth appears to be driven by socially motivated demand by Western consumers who are willing to pay more for coffee that is produced in a manner consistent with Fair Trade certification. A number of recent studies focusing on coffee provide convincing evidence that the demand for Fair Trade-certified products is significantly higher and less price-sensitive than for conventional products.[2]

Among the products that have Fair Trade certification, coffee is the largest product category. A comparison of coffee with other products in terms of the number of producers that fall under the certification is shown in Figure 1. Fair Trade accounts for 48 percent of all Fair Trade farmers and for 46 percent of total premiums paid.[3] Given this, my research has tended to focus on this sector.

Fair Trade uses two primary mechanisms in an attempt to achieve its goal of improving the lives of farmers in developing countries. The first is a guaranteed minimum price to be paid if the product is sold as Fair Trade. This is meant to cover the average costs of sustainable production and to provide a guarantee that reduces the risk faced by coffee growers. The second is a price premium paid to producers. This premium is in addition to the sales price and must be set aside and invested in projects that improve the quality of life of producers and their communities. The specifics of how the premium is used must be reached in a democratic manner by the producers themselves.

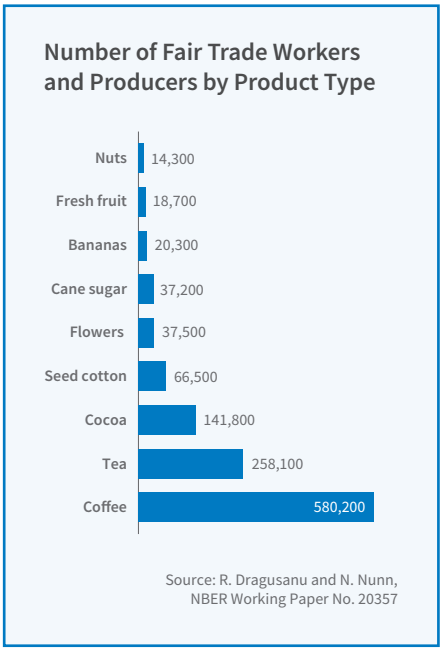


Figure 1

The relationship between the sum of the minimum price and price premium — the guaranteed amount that Fair Trade-certified producers

receive if their products are sold as Fair Trade — and the market price is shown in Figure 2 for coffee. From the figure it is clear that the market price for coffee has historically been volatile and that, for significant periods of time, the market price has been below the Fair Trade price.

Despite the rapid growth and pervasiveness of Fair Trade products, well-identified evidence of the effects of Fair Trade certification remains scarce. The question remains: Does Fair Trade accomplish its intended goals? Does it really work? My recent study with Raluca Dragusanu attempts to answer this question by estimating the effects of Fair Trade certification within the coffee sector in Costa Rica.[4]

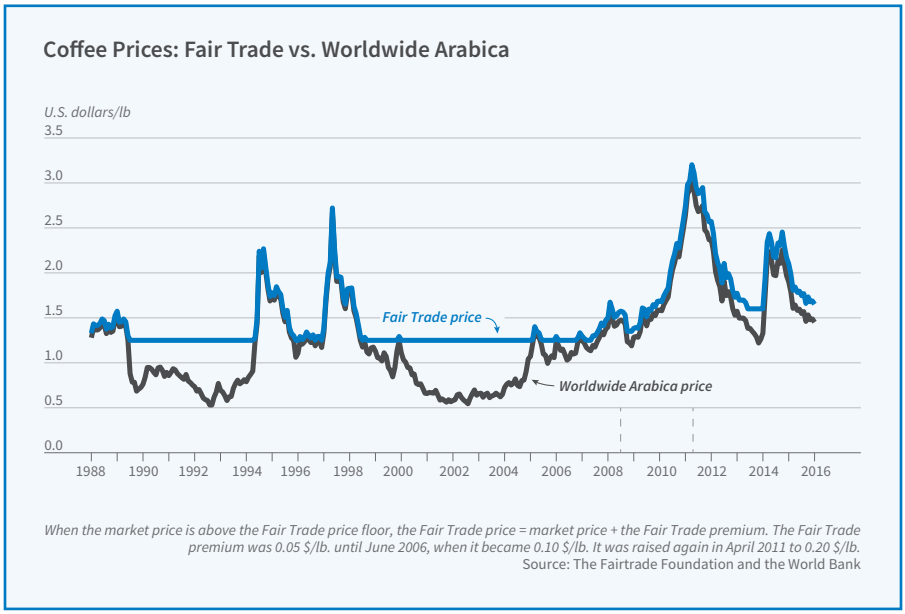


Figure 2

The primary issue one faces when attempting to identify the causal effects of Fair Trade is that certification is endogenous. For example, mills may become certified when they also obtain a lucrative long-term contract from a large buyer like Starbucks. To gain a better understanding of the nature of selection into certification, in August 2012 we interviewed several Fair Trade-certified coffee cooperatives to collect information on the factors that lead co-ops to become Fair Trade-certified. Importantly, and perhaps surprisingly, we learned that the reasons for selection appear to be ambiguous or even negative. In theory, positive selection could arise, since those with the greatest capacity to adopt Fair Trade are also capable in other dimensions of business. However, in reality, the most common narrative during our interviews was that Fair Trade was something that producers resorted to only if they had difficulty selling their coffee otherwise.

The study examines the universe of coffee mills in Costa Rica, observed annually over a sixteen-year period, 1999–2014. The analysis accounts for time-invariant differences across mills, as well as mill-invariant differences across years. Despite accounting for these factors, it is still possible that selection into certification results in misleading estimates of the causal effect of Fair Trade certification. Thus, the estimation strategy also exploits the fact that the expected benefits that accrue because of Fair Trade certification varied significantly during our sample period. This is true both because of variation in the market price of conventional coffee and in the price paid for Fair Trade-certified coffee due to changes in the Fair Trade minimum price and price premium. This generates time variation in the price difference between Fair Trade and conventional coffee, which the study also exploits.

The estimates indicate that when the price floor is binding, Fair Trade-certified producers sell their products at higher prices and earn more revenues. Thus, Fair Trade does have some effect. However, we also find that the effect of Fair Trade is limited to only a fraction of the market: not all coffee that is eligible to be sold as Fair Trade can actually be sold as Fair Trade by Fair Trade-certified farmers.[5] The magnitude of our estimates is consistent with this fact. Taken at face value, they indicate that only 12 percent of Fair Trade-eligible coffee was sold as Fair Trade over our sample period. Put differently, we find that if the effective price benefit to Fair Trade certification — the difference between the Fair Trade and conventional prices — increases by 1 cent, the average price benefit received by Fair Trade-certified mills is only 0.12 cents.

We then turn to upstream effects and estimate the effects of Fair Trade certification on intermediaries, farmers, and farm employees. We link Fair Trade certification to these individuals, observed in household survey data, by constructing a measure of the share of exports in a canton (an administrative region in Costa Rica) and year that is from Fair Trade-certified producers.

Since one of the explicit goals of Fair Trade is to set aside funds for community projects, it is possible that households not directly involved in coffee production, but living in the same canton, may also benefit from an increase in Fair Trade certification. Thus, our analysis checks for the presence of spillovers by examining the effects of Fair Trade certification on all households in a canton, including those not employed in the coffee sector.

We find no evidence of positive spillover effects from Fair Trade certification to households in the canton not working in the coffee sector. For those working within the coffee sector, we find sizeable, highly uneven benefits.

Within the coffee sector, we separately estimate the effects of Fair Trade on the incomes of three groups. The first is skilled coffee growers, who are primarily farm owners and are 33 percent of those working in the coffee sector. The second is unskilled workers, such as coffee pickers and farm laborers. This is the largest group, accounting for 61 percent of those working in the sector. The third is non-farm occupations in the coffee sector, primarily intermediaries and their employees who are responsible for transportation, storage, and sales. This group accounts for 6 percent of those working in the sector. The size and average annual income of each group in our sample are summarized in Figure 3. The figure also summarizes the estimated effects for each group.

We find large positive income effects for farm owners. An increase from zero to the mean Fair Trade-certification intensity is associated with a 2.2 percent increase in average income. Given that this group is one-third of those working in the coffee sector, this is a sizeable benefit that affects a large number of individuals. However, we also find that for unskilled workers, the poorest and largest group within the coffee sector, there is no evidence of a positive effect of Fair Trade on incomes. The estimated effects for this group are small and statistically insignificant. Lastly, we find that the small group of intermediaries in nonfarm occupations is hurt significantly by Fair Trade. For this group, the same increase in Fair Trade intensity is associated with a 2.6 percent decline in average incomes. Since intermediaries have incomes that are approximately 40 percent higher than those of farm owners, a consequence of Fair Trade is that it decreases income inequality within the coffee sector by transferring rents from higher-income intermediaries to lower-income farm owners.

According to our estimates, about 10 percent of the gains to farm owners are likely due to the losses to intermediaries, while the remaining 90 percent of the gains are explained by the minimum price of Fair Trade-certified coffee. The magnitudes of our estimated effects line up very closely with expected benefits to Fair Trade, based on actual sales by Fair Trade-certified producers, the difference between the world price and the Fair Trade price guarantee, and the number of coffee producers, workers, and intermediaries in Costa Rica during our sample period.

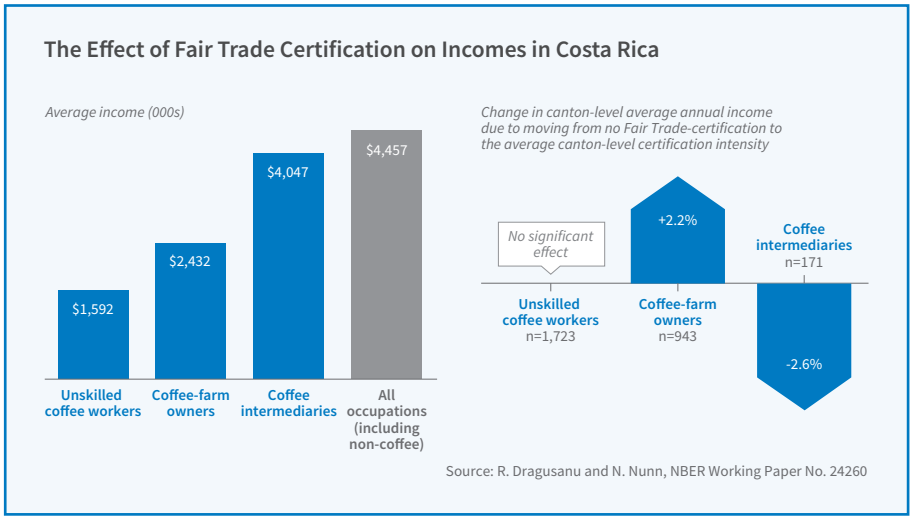


Figure 3

Motivated by the fact that within Costa Rica, cooperatives commonly use Fair Trade premiums for building schools, purchasing materials, and providing scholarships, we also examine the effect of Fair Trade certification on education, as measured by the enrollment of school-aged children. However, we find no evidence of positive effects of Fair Trade on schooling. The one education effect of Fair Trade that we do find is adverse: For the children of intermediaries, Fair Trade certification is associated with a 7.3 percentage-point decrease in the probability of high school enrollment. These effects are likely due to the large negative income effects that we find for coffee intermediaries.

In the end, our household estimates paint a mixed picture. Fair Trade appears to have helped farm owners, increasing their incomes. Part of these gains (approximately 10 percent) appears to arise from a transfer of rents from intermediaries. This is likely due to the creation of farmer cooperatives that perform many of the activities that intermediaries would otherwise perform. As a consequence, Fair Trade is also associated with a significant reduction in the incomes of intermediaries in the coffee sector. By these metrics, Fair Trade appears to be accomplishing some of its stated goals. The relatively impoverished coffee farmers gain at the expense of the wealthier coffee intermediaries. However, we also find that the poorest and largest group within the coffee sector — unskilled workers — does not gain at all from Fair Trade. In addition, we find no evidence of positive spillovers of benefits to those in the local community who work outside of the coffee sector.

---

[1] *R. Dragusanu, D. Giovannucci, and N. Nunn, "The Economics of Fair Trade," NBER Working Paper No. 20357, July 2014, and* Journal of Economic Perspectives, *28(3), 2014, pp. 217–36.* Return to Text

[2] *C. Arnot, P. Boxall, and S. Cash, "Do Ethical Consumers Care About Price? A Revealed Preference Analysis of Fair Trade Coffee Purchases,"* Canadian Journal of Agricultural Economics, *54(4), 2006, pp. 555–65; M. Hiscox, M. Broukhim, and C. Litwin, "Consumer Demand for Fair Trade: New Evidence from a Field Experiment using eBay Auctions of Fresh- Roasted Coffee," 2011. Mimeo,*

Harvard University; and J. Hainmueller, M. Hiscox, and S. Sequeira, "Consumer Demand for Fair Trade: Evidence from a Multistore Field Experiment," Review of Economics and Statistics, *97(2), 2015, pp. 242–56.*
Return to Text

3 *Fairtrade International, "Monitoring the Scope and Benefits of Fairtrade. Monitoring Report, 9th Edition," 2018.*
Return to Text

4 *R. Dragusanu and N. Nunn, "The Effects of Fair Trade Certification: Evidence from Coffee Producers in Costa Rica," NBER Working Paper No. 24260, January 2018.*
Return to Text

5 *A. de Janvry, C. McIntosh, and E. Sadoulet, "Fair Trade and Free Entry: Can a Disequilibrium Market Serve as a Development Tool?"* Review of Economics and Statistics, *97(3), 2015, pp. 567–73.*
Return to Text

Martin Feldstein, 1939–2019
Renowned Economist and NBER President Emeritus

Martin Feldstein, president of the NBER for nearly 30 years, George F. Baker Professor of Economics at Harvard University, chair of the President's Council of Economic Advisers from 1982 to 1984, and one of the most prolific and influential economists of the last half century, passed away on Tuesday, June 11. He was 79.

Feldstein's leadership of the NBER had a profound and lasting effect on applied economic research. He was appointed president of the NBER in 1977 and, aside from his years of CEA service, served in this role until 2008. He transformed the organization and created the network structure that today encompasses nearly 1,600 affiliated scholars. He moved the NBER headquarters from New York City to Cambridge, launched the NBER Summer Institute and regular meetings of program groups, and promoted NBER working papers as an important channel for dissemination of economic research. Feldstein recognized the value of enhanced communication, at conferences and through sharing pre-publication manuscripts, in advancing research progress. He authored or coauthored 165 NBER working papers and edited 19 NBER books.

Feldstein pioneered the use of data collected from household surveys and corporate databases to study a wide range of questions in public policy. He played a key role in shaping the modern fields of public and health economics. His dissertation, which analyzed the efficiency of the National Health Service in the United Kingdom, helped launch the field of health economics. His research on Social Security and unemployment insurance called attention to the effect of these programs on saving, retirement, and labor supply. He documented the way taxes affect the behavior of households and firms, focusing in particular on how taxes on investment and saving could discourage capital accumulation and slow long-term economic growth.

Feldstein graduated from Harvard College in 1961 and received his D.Phil. in Economics from Oxford University, where he was an Official Fellow of Nuffield College. He joined the Harvard faculty in 1967, became a tenured professor of economics in 1969, and was appointed the George F. Baker Professor of Economics in 1984. For over two decades, he taught an introductory economics course, "Social Analysis 10" or "Ec 10," which was often the largest undergraduate course at Harvard College. He was also a celebrated graduate teacher and dissertation adviser. Many of his students have gone on to influential careers in academia and public policy making.

In 1977, Feldstein received the John Bates Clark Medal of the American Economic Association, an award presented to an economist under the age of 40 judged to have made the greatest contribution to economic science. In recognizing the breadth of Feldstein's work, the prize citation described his research as "covering an astonishing array of economic methods and problems." He served as president of the American Economic Association in 2004.

Feldstein played an active role in public policy discussions for more than four decades. In addition to chairing President Reagan's Council of Economic Advisers, he served on President Obama's Economic Recovery Advisory Board. He was a trustee of the Council on Foreign Relations, a member of the Trilateral Commission and the Group of 30, and a frequent contributor to *The Wall Street Journal*. He wrote broadly on economic policy issues.

Feldstein was widely celebrated for his academic accomplishments. He was a Fellow of the American Academy of Arts and Sciences, the British Academy, the Econometric Society, and the National Association of Business Economics, and was the recipient of several honorary degrees. Feldstein is survived by his wife, Kathleen, also an economist, two daughters, and four grandchildren.

The NBER is collecting remembrances from those who would like to acknowledge Martin Feldstein's contributions and influence, but have not otherwise contacted the Feldstein family. Please send such messages, ideally as an email attachment, on letterhead, and limited to a single page, to Debby Nicholson at burke@nber.org.

Media Reports on Martin Feldstein's Life

- The Wall Street Journal
- The Financial Times
- The New York Times
- CNN
- The Washington Post
- The Economist
- Bloomberg (6/12/19) (6/11/19)
- The Harvard Gazette
- The Chronicle of Philanthropy

John S. Clarkeson, 1942–2019

John S. Clarkeson, who was elected as an at-large member of the NBER Board of Directors in 2001 and served as vice-chair from 2005 until 2008 and board chair from 2008 until 2011, passed away unexpectedly in May after a brief illness. He was 76.

Clarkeson, who graduated from Harvard College and Harvard Business School, spent his career of more than 40 years at the Boston Consulting Group, including a highly successful time as CEO between 1986 and 1997. On his watch, the firm grew from about 300 to more than 3000 employees worldwide, and became established as one of the world's leading consultancies.

Clarkeson was an active member of the NBER board and a long-serving member of its executive and nominating committees. He played an especially significant role in advancing the conflict of interest disclosure policy for NBER affiliates. He was also a trustee of INSEAD, Wellesley College, and the Educational Testing Service, and a board member at a number of firms. He was honored by the New England chapter of the National Association of Corporate Directors as its "Director of the Year for Corporate Governance" in 2016.

New Research Associates, Faculty Research Fellows Named

The NBER Board of Directors appointed 14 research associates at its April 2019 meeting. New research associates, who must be tenured faculty members at North American colleges or universities, are recommended to the board by the directors of the NBER's 20 research programs, typically after consultation with a steering committee of leading scholars in the program area. Two of the new research associates were previously faculty research fellows.

Faculty research fellows, who are appointed by the NBER president, must hold primary academic appointments in North America. They also are recommended by program directors and their steering committees in the culmination of a highly competitive process that begins with a call for nominations in January. Candidates are evaluated based on their research records and their capacity to contribute to the NBER's activities. This year, 246 researchers were nominated for faculty research fellowships; 47 were appointed.

The 61 newly-appointed researchers are affiliated with 35 different colleges and universities. They completed graduate studies at 29 different institutions. On May 1, there were 1,219 NBER research associates and 345 faculty research fellows.

The newly appointed researchers, their universities, and their NBER program affiliations, are listed below. Entries in italics indicate research associates who were promoted from the rank of faculty research fellows.

Research Associates

Francisco Buera, Washington University in St. Louis
Economic Fluctuations and Growth

Davin Chor, Dartmouth College
International Trade and Investment

Isil Erel, Ohio State University
Corporate Finance

Nicole Fortin, University of British Columbia
Labor Studies

Erica Fuchs, Carnegie Mellon University
Productivity, Innovation, and Entrepreneurship

Jessica Goldberg, University of Maryland
Development Economics

Fabian Lange, McGill University
Labor Studies

Benjamin Moll, Princeton University
Economic Fluctuations and Growth

Daniel Rees, University of Colorado at Denver
Health Economics

Ayşegül Şahin, University of Texas at Austin
Monetary Economics

Angelino Viceisza, Spelman College
Productivity, Innovation, and Entrepreneurship

Alessandra Voena, University of Chicago
Labor Studies

Maisy Wong, University of Pennsylvania
Development Economics

Leeat Yariv, Princeton University
Political Economy

Faculty Research Fellows

Anjali Adukia, University of Chicago
Economics of Education

Jennie Bai, Georgetown University
Asset Pricing

Jie Bai, Harvard University
Development Economics

Scott Baker, Northwestern University
Political Economy

Silvia Barcellos, University of Southern California
Aging

Lauren Bergquist, University of Michigan
Development Economics

Judson Boomhower, University of California, San Diego
Environment and Energy Economics

Fiona Burlig, University of Chicago
Environment and Energy Economics

Patrick Button, Tulane University
Aging

Eric Chyn, University of Virginia
Political Economy

Zack Cooper, Yale University
Health Care

Clement de Chaisemartin, University of California, Santa Barbara
Economics of Education

Wenxin Du, University of Chicago
Asset Pricing

Mark Egan, Harvard University
Corporate Finance

Michael Ewens, California Institute of Technology
Productivity, Innovation, and Entrepreneurship

Maryam Farboodi, MIT
Asset Pricing

Adam Guren, Boston University
Monetary Economics

Kyle Handley, University of Michigan
International Trade and Investment

Tatiana Homonoff, New York University
Political Economy

John Horton, New York University
Labor Studies

Gaston Illanes, Northwestern University
Industrial Organization

Ruixue Jia, UC, San Diego
Political Economy

Réka Juhász, Columbia University
Development of the American Economy

Krzysztof Karbownik, Emory University
Children

Ethan Lieber, University of Notre Dame
Health Care

Ilse Lindenlaub, Yale University
Economic Fluctuations and Growth

Michael Luca, Harvard University
Productivity, Innovation, and Entrepreneurship

Isaac Mbiti, University of Virginia
Development Economics

Robert Metcalfe, Boston University
Environment and Energy Economics

Ferdinando Monte, Georgetown University
International Trade and Investment

Erik Nesson, Ball State University
Health Economics

Pablo Ottonello, University of Michigan
International Finance and Macroeconomics

Analisa Packham, Miami University
Children

Nitya Pandalai-Nayar, University of Texas at Austin
International Finance and Macroeconomics

Santiago Pérez, University of California, Davis
Development of the American Economy

Giorgia Piacentino, Columbia University
Corporate Finance

Tobias Salz, MIT
Industrial Organization

Raul Sanchez de le Sierra, University of California, Berkeley
Political Economy

Heather Sarsons, University of Chicago
Labor Studies

Molly Schnell, Northwestern University
Health Care

Ludwig Straub, Harvard University
Monetary Economics

Pietro Tebaldi, University of Chicago
Industrial Organization

Owen Thompson, Williams College
Children

Andrea Vedolin, Boston University
Asset Pricing

Kevin Williams, Yale University
Industrial Organization

Jack Willis, Columbia University
Development Economics

Constantine Yannelis, University of Chicago
Economics of Education

Conferences

Economic Consequences of Trade

An NBER conference on Economic Consequences of Trade took place April 5–6 in Cambridge. Research Associate Stephen J. Redding of Princeton University organized the meeting, which was sponsored by the Smith Richardson Foundation. These researchers' papers were presented and discussed:

- **Ryan Kim**, Johns Hopkins University, and **Jonathan Vogel**, University of California, Los Angeles and NBER, "Trade and Inequality across Local Labor Markets: The Margins of Adjustment"
- **Gene M. Grossman**, Princeton University and NBER, and **Elhanan Helpman**, Harvard University and NBER, "Identity Politics and Trade Policy" (NBER Working Paper No. 25348)
- **Paula Bustos**, CEMFI; **Joan Monras**, Universitat Pompeu Fabra; **Jacopo Ponticelli**, Northwestern University; and **Juan Manuel Castro Vincenzi**, Princeton University, "Structural Transformation, Industrial Specialization, and Endogenous Growth"
- **Alonso de Gortari**, Princeton University, "Disentangling Global Value Chains"
- **Kevin Lim**, University of Toronto; **Daniel Trefler**, University of Toronto and NBER; and **Miaojie Yu**, Peking University, "Trade and Innovation: The Role of Scale and Competition Effects"
- **Kirill Borusyak**, Princeton University, and **Xavier Jaravel**, London School of Economics, "The Distributional Effects of Trade: Theory and Evidence from the United States"
- **Donald R. Davis**, Columbia University and NBER, and **Eric Mengus** and **Tomasz K. Michalski**, HEC Paris, "Labor Market Polarization and the Great Divergence: Theory and Evidence"
- **Spencer Lyon**, New York University, and **Michael E. Waugh**, New York University and NBER, "Quantifying the Losses from International Trade"
- **David Baqaee**, University of California, Los Angeles, and **Emmanuel Farhi**, Harvard University and NBER, "Networks, Barriers, and Trade"
- **Rui Costa**, **Swati Dhingra**, and **Stephen J. Machin**, London School of Economics, "Trade and Worker Deskilling"
- **Nicholas Bloom**, Stanford University and NBER; **Kyle Handley**, University of Michigan; **André Kurmann**, Drexel University; and **Philip A. Luck**, University of Colorado, Denver, "The Impact of Chinese Trade on U.S. Employment: The Good, the Bad, and the Apocryphal"

Summaries of these papers are at www.nber.org/conferences/2019/ECTs19/summary.html

Longer Working Lives and Labor Demand

An NBER conference on Longer Working Lives and Labor Demand took place April 5 in Cambridge. Research Associate Kevin S. Milligan of the University of British Columbia organized the meeting, which was sponsored by the Alfred P. Sloan Foundation. These researchers' papers were presented and discussed:

- **Courtney Coile**, Wellesley College and NBER; **Kevin S. Milligan**; and **David A. Wise**, Harvard University and NBER, "Social Security Programs and Retirement Around the World: Working Longer — Introduction and Summary"
- **Giulia Bovini**, London School of Economics, and **Matteo Paradisi**, Harvard University, "Labor Substitutability and the Impact of Raising the Retirement Age"

- **Nicole Maestas**, Harvard University and NBER; **Kathleen J. Mullen**, **David Powell**, and **Jeffrey Wenger**, RAND Corporation; and **Till M. von Wachter**, University of California, Los Angeles and NBER, "The Value of Working Conditions in the United States and Implications for the Structure of Wages" (NBER Working Paper No. 25204)
- **Simon Jäger**, MIT and NBER, "Marginal Jobs and Job Surplus: A Test of the Efficiency of Separations" (NBER Working Paper No. 24492)
- **Francesca Carta** and **Francesco D'Amuri**, Bank of Italy, and **Till M. von Wachter**, University of California, Los Angeles and NBER, "Workforce Aging, Pension Reforms, and Firm Dynamics"

Summaries of these papers are at www.nber.org/conferences/2019/LWLs19/summary.html

The 34th Annual Conference on Macroeconomics

The 34th NBER Annual Conference on Macroeconomics took place April 11–12 in Cambridge. Research Associates Martin S. Eichenbaum of Northwestern University, Erik Hurst of the University of Chicago, and Jonathan A. Parker of MIT organized the meeting. These researchers' papers were presented and discussed:

- **Nir Jaimovich**, University of Zurich; **Sergio Rebelo**, Northwestern University and NBER; **Arlene Wong**, Princeton University and NBER; and **Miao Ben Zhang**, University of Southern California, "Trading up and the Skill Premium"
- **Davide Debortoli**, Universitat Pompeu Fabra; **Jordi Galí**, CREI and NBER; and **Luca Gambetti**, Universitat Autònoma de Barcelona, "On the Empirical (Ir)Relevance of the Zero Lower Bound Constraint"
- **Michael McLeay**, Bank of England, and **Silvana Tenreyro**, London School of Economics, "Optimal Inflation and the Identification of the Phillips Curve"
- **Margherita Borella**, Università di Torino; **Mariacristina De Nardi**, Federal Reserve Bank of Minneapolis and NBER; and **Fang Yang**, Louisiana State University, "The Lost Ones: The Opportunities and Outcomes of Non-College Educated Americans Born in the 1960s" (NBER Working Paper No. 25661)
- **Chong-En Bai**, Tsinghua University; **Chang-Tai Hsieh**, University of Chicago and NBER; and **Zheng Michael Song**, Chinese University of Hong Kong, "Special Deals with Chinese Characteristics"
- **Matias Covarrubias** and **Germán Gutiérrez,** New York University, and **Thomas Philippon,** New York University and NBER, "Explaining the Rising Concentration of U.S. Industries: Superstars, Intangibles, Globalization or Barriers to Entry?"

Summaries of these papers are at www.nber.org/conferences/2019/Macro19/summary.html

Innovation Policy and the Economy

An NBER conference on Innovation Policy and the Economy took place April 16 in Washington, DC. Research Associates Josh Lerner of Harvard University and Scott Stern of MIT organized the meeting, which was sponsored by the Ewing Marion Kauffman Foundation. These researchers' papers were presented and discussed:

- **William R. Kerr**, Harvard University and NBER, "The Gift of Global Talent" (based on his recent book)
- **Ashish Arora** and **Sharon Belenzon**, Duke University and NBER; **Andrea Patacconi**, Norwich Business School; and **Jungkyu Suh**, Duke University, "The Changing Structure of American Innovation: Cautionary Remarks for Economic Growth"
- **Margaret Kyle**, MINES ParisTech, "The Alignment of Innovation Policy and Social Welfare: Evidence from Pharmaceuticals"

- **Fiona Scott Morton**, Yale University and NBER; **Carl Shapiro**, University of California, Berkeley and NBER; and **Giulio Federico**, European Commission, "Antitrust and Innovation: Welcoming and Protecting Disruption"
- **Edward L. Glaeser**, Harvard University and NBER, and **Naomi Hausman**, Hebrew University, "The Spatial Mismatch between Innovation and Joblessness"
- **Albert Bravo-Biosca**, Nesta, "Experimental Innovation Policy"

Summaries of these papers are at www.nber.org/conferences/2019/IPEs19/summary.html

Economics of Culture and Institutions

An NBER conference on the Economics of Culture and Institutions took place April 27 in Cambridge. Research Associates Alberto Bisin of New York University and Paola Giuliano of the University of California, Los Angeles organized the meeting. These researchers' papers were presented and discussed:

- **Nicola Gennaioli,** Bocconi University, and **Guido Tabellini,** IGIER, "Identity, Beliefs, and Political Conflict"
- **Michela Carlana,** Harvard University; **Alberto F. Alesina,** Harvard University and NBER; **Eliana La Ferrara** and **Paolo Pinotti,** Bocconi University, "Revealing Stereotypes: Evidence from Immigrants in Schools" (NBER Working Paper No. 25333)
- **Ruochen Dai,** Peking University; **Dilip Mookherjee,** Boston University and NBER; **Kaivan Munshi**, University of Cambridge; and **Xiaobo Zhang,** Peking University, "The Community Origins of Private Enterprise in China"
- **David Atkin,** Massachusetts Institute of Technology and NBER; **Eve Sihra** and **Moses Shayo,** Hebrew University, "How Do We Choose Our Identity? A Revealed Preference Approach Using Food Consumption" (NBER Working Paper No. 25693)
- **Mathias Iwanowsky,** University of Munich, and **Andreas Madestam,** Stockholm University, "State Repression, Exit, and Voice: Living in the Shadow of Cambodia's Killing Fields"
- **Anke Becker**, Harvard University, "On the Economic Origins of Constraints on Women's Sexuality"

Summaries of these papers are at www.nber.org/conferences/2019/CIs19/summary.html

Economics of Energy Use in Transportation

An NBER conference on Economics of Energy Use in Transportation took place May 2–3 in Washington, DC. Kate S. Whitefoot of Carnegie Mellon University and Research Associates Meghan R. Busse of Northwestern University and Christopher R. Knittel of MIT organized the meeting, which was sponsored by the Alfred P. Sloan Foundation and the U.S. Department of Energy. These researchers' papers were presented and discussed:

- **Erich Muehlegger**, University of California, Davis and NBER, and **David S. Rapson**, University of California, Davis, "Estimating Demand for Electric Vehicles in Low- and Middle-income Households"
- **Steven T. Berry**, **Kenneth Gillingham**, and **James A. Levinsohn**, Yale University and NBER, "Technological Innovation and Per-Mile Automobile Insurance: Effects on Patterns of Vehicle Usage"
- **Samuel Stolper**, University of Michigan, "Local Pass-Through and the Regressivity of Taxes: Evidence from Automotive Fuel Markets"

- **James B. Bushnell**, University of California, Davis and NBER, and **Jonathan E. Hughes**, University of Colorado at Boulder, "Energy Consumption, Emissions and Modal Substitution in U.S. Freight Transportation"
- **Jeremy J. Michalek**, **Inês Azevedo**, **Constantine Samaras**, and **Pedro Ferreira**, Carnegie Mellon University, and **Nicholas Muller**, Carnegie Mellon University and NBER, "Effects of On-Demand Ridesourcing on U.S. Vehicle Ownership, Travel Patterns, and Energy Use Externalities"
- **Jackson Dorsey**, Indiana University; **Ashley Langer**, University of Arizona; and **Shaun McRae**, ITAM, "Fueling Alternatives: Evidence from Real-World Driving Data"
- **Stephen P. Holland**, University of North Carolina at Greensboro and NBER; **Erin T. Mansur**, Dartmouth College and NBER; **Nicholas Muller**, Carnegie Mellon University and NBER; and **Andrew J. Yates**, University of North Carolina at Chapel Hill, "Environmental Benefits from Transportation Electrification"
- **Ziyan Chu**, Resources for the Future, and **Yichen Christy Zhou**, Clemson University, "The Effect of Adopting the Next Generation Air Transportation System on Air Travel Performance"

Summaries of these papers are at www.nber.org/conferences/2019/EUTs19/summary.html

Blockchain, Distributed Ledgers, and Financial Contracting

An NBER conference on Blockchain, Distributed Ledgers, and Financial Contracting took place May 2–3 in Cambridge. Research Associates Dean Corbae of the University of Wisconsin-Madison, Zhiguo He of the University of Chicago, and Robert Townsend of MIT organized the meeting, which was sponsored by the Puelicher Center for Banking Education at the University of Wisconsin-Madison. These researchers' papers were presented and discussed:

- **Jonathan Chiu**, Bank of Canada, and **Thorsten V. Koeppl**, Queen's University, "The Economics of Cryptocurrency Bitcoin and Beyond"
- **Simon Janin** and **Akaki Mamageishvili**, ETH Zurich, and **Arthur Gervais**, Imperial College London, "FileBounty: Secure and Efficient File Exchange in Rational Adversarial Environment"
- **Nick Arnosti**, Columbia University, and **Matt Weinberg**, The Ohio State University, "Bitcoin: A Natural Oligopoly"
- **Leonid Kogan**, MIT and NBER, "Economics of Proof-of-Stake Payment Systems"
- **Sean Cao** and **Baozhong Yang**, Georgia State University, and **William Cong**, University of Chicago, "Financial Reporting and Blockchains: Audit Pricing, Misstatements, and Regulation"
- **Tetiana Davydiuk**, Carnegie Mellon University; **Deeksha Gupta**, University of Pennsylvania; and **Samuel Rosen**, Temple University, "De-crypto-ing Signals in Initial Coin Offerings: Evidence of Rational Token Retention"

Summaries of these papers are at www.nber.org/conferences/2019/BDLs19/summary.html

New Developments in Long-Term Asset Management

The NBER conference New Developments in Long-Term Asset Management took place May 9–10 in Cambridge. Research Associates Monika Piazzesi of Stanford University and Luis M. Viceira of Harvard University organized the meeting, which was sponsored by Norges Bank Investment Management. These researchers' papers were presented and discussed:

- **Matthew Backus**, Columbia University and NBER; **Christopher Conlon**, New York University; and **Michael Sinkinson**, Yale University and NBER, "Common Ownership in America: 1980–2017" (NBER Working Paper No. 25454)

- **Andra C. Ghent**, University of Wisconsin-Madison, "What's Wrong with Pittsburgh? Delegated Investors and Liquidity Concentration"
- **Aleksandar Andonov**, University of Amsterdam; **Roman Kräussl**, University of Luxembourg; and **Joshua Rauh**, Stanford University and NBER, "The Subsidy to Infrastructure as an Asset Class" (NBER Working Paper No. 25045)
- **Lubos Pastor**, University of Chicago and NBER; **Robert F. Stambaugh**, University of Pennsylvania and NBER; and **Lucian A. Taylor**, University of Pennsylvania, "Fund Tradeoffs" (NBER Working Paper No. 23670)
- **Mikhail Chernov**, University of California, Los Angeles and NBER; **Lars A. Lochstoer**, University of California, Los Angeles; and **Stig Lundeby**, Norwegian School of Economics, "Conditional Dynamics and the Multi-Horizon Risk-Return Trade-off" (NBER Working Paper No. 25361)
- **Ralph S. J. Koijen**, University of Chicago and NBER; **Robert J. Richmond**, New York University; and **Motohiro Yogo**, Princeton University and NBER, "Which Investors Matter for Global Equity Valuations and Expected Returns?"
- **Robin Greenwood**, Harvard University and NBER, and **Annette Vissing-Jorgensen**, University of California, Berkeley and NBER, "The Impact of Pensions and Insurance on Global Yield Curves"
- **Arpit Gupta**, New York University, and **Stijn Van Nieuwerburgh**, Columbia University and NBER, "Valuing Private Equity Investments Strip by Strip"
- **Anil K. Kashyap**, University of Chicago and NBER; **Natalia Kovrijnykh**, Arizona State University; **Jian Li**, University of Chicago; and **Anna Pavlova**, London Business School, "The Benchmark Inclusion Subsidy" (NBER Working Paper No. 25337)

Summaries of these papers are at www.nber.org/conferences/2019/LTAMs19/summary.html

Machine Learning in Health Care

An NBER conference on Machine Learning in Health Care took place May 10 in Cambridge. Research Associates David M. Cutler of Harvard University and Sendhil Mullainathan of the University of Chicago, and Ziad Obermeyer of the University of California, Berkeley organized the meeting, which was sponsored by the National Institute on Aging.. These researchers' papers were presented and discussed:

- **Hagai Rossman** and **Smadar Shilo**, Weizmann Institute of Science, "Childhood Obesity Prediction and Risk Factor Analysis from Nationwide Health Records"
- **Jason Abaluck**, Yale University and NBER; **Leila Agha**, Dartmouth College and NBER; and **David C. Chan, Jr.**, Stanford University and NBER, "Who Should Get Blood? Personalizing Medicine with Heterogeneous Treatment Effects"
- **Emma J. Pierson** and **Jure Leskovec**, Stanford University, **David M. Cutler**, **Sendhil Mullainathan**, and **Ziad Obermeyer**, "Using Machine Learning to Explain Socioeconomic and Racial Gaps in Pain"
- **Rediet Abebe**, Cornell University; **Shawndra Hill** and **Jennifer Wortman Vaughan**, Microsoft Research; **Peter M. Small**, Rockefeller Foundation; and **H. Andrew Schwartz**, Stony Brook University, "Using Search Queries to Understand Health Information Needs in Africa"
- **Tony Duan**, **Pranav Rajpurkar**, **Dillon Laird**, **Andrew Ng**, and **Sanjay Basu**, Stanford University, "Clinical Value of Predicting Individual Treatment Effects for Intensive Blood Pressure Therapy: A Machine Learning Experiment to Estimate Treatment Effects from Randomized Trial Data"
- **Michael A. Ribers**, University of Copenhagen, and **Hannes Ullrich**, DIW Berlin, "Battling Antibiotic Resistance: Can Machine Learning Improve Prescribing?"

Summaries of these papers are at www.nber.org/conferences/2019/MLHCs19/summary.html

Environmental and Energy Policy and the Economy

Members of the NBER's Program on Environmental and Energy Policy and the Economy met May 16 in Washington, DC. Research Associates Matthew Kotchen of Yale University and James H. Stock of Harvard University, and Program Director Catherine Wolfram of the University of California, Berkeley organized the meeting, which was sponsored by the Alfred P. Sloan Foundation. These researchers' papers were presented and discussed:

- **Antonio Bento**, University of Southern California and NBER; **Mark R. Jacobsen**, University of California, San Diego and NBER; **Christopher R. Knittel**, MIT and NBER; and **Arthur van Benthem**, University of Pennsylvania and NBER, "Estimating the Costs and Benefits of Fuel Economy Standards"
- **Robert Stavins**, Harvard University and NBER, "The Future of U.S. Carbon-Pricing Policy"
- **Caroline Flammer**, Boston University, "Green Bonds: Effectiveness and Implications for Public Policy"
- **Lucas W. Davis** and **James M. Sallee**, University of California, Berkeley and NBER, "Should Electric Vehicle Drivers Pay a Mileage Tax?"
- **Nicholas Muller**, Carnegie Mellon University and NBER, "Long-Run Environmental Accounting in the U.S. Economy"
- **Marc A. C. Hafstead**, Resources for the Future, and **Roberton C. Williams III**, University of Maryland and NBER, "Jobs and Environmental Regulation"

Summaries of these papers are at www.nber.org/conferences/2019/EEPEs19/summary.html

Economics of Research and Innovation in Agriculture

An NBER conference on the Economics of Research and Innovation in Agriculture took place May 17 in Washington, DC. Research Associate Petra Moser of New York University organized the meeting, which was sponsored by the U.S. Department of Agriculture Economic Research Service. These researchers' papers were presented and discussed:

- **Bradford L. Barham**, **Jeremy D. Foltz**, and **Ana Paula Melo**, University of Wisconsin-Madison, "Academic Engagement, Commercialization, and Scholarship: Empirical Evidence from Agricultural and Life Scientists at U.S. Land Grant Universities"
- **Ellen M. Bruno**, University of California, Berkeley, and **Katrina Jessoe**, University of California, Davis, "Water Prices, Water Markets, and Incentives to Adopt Agricultural Technology"
- **Jared P. Hutchins**, **Brent Hueth**, and **Guilherme Rosa**, University of Wisconsin-Madison, "Quantifying Heterogeneous Returns to Genetic Selection: Evidence from Wisconsin Dairies"
- **Michael J. Andrews**, NBER, "The Location of Public Agricultural Research Facilities and the Rate and Direction of Agricultural Innovation"
- **Matthew S. Clancy**, **Yongjie Ji,** and **GianCarlo Moschini**, Iowa State University, and **Paul Heisey**, U.S. Department of Agriculture, "The Roots of Agricultural Innovation: Evidence from Patents"
- **Keith Meyers**, University of Southern Denmark, and **Paul Rhode**, University of Michigan and NBER, "Exploring the Causes Driving Hybrid Corn Adoption from 1933 to 1955"
- **Gregory D. Graff**, Colorado State University, and **David Zilberman**, University of California, Berkeley, "Venture Capital and the Transformation of Private R&D for Agriculture and Food"

Summaries of these papers are at www.nber.org/conferences/2019/RIAs19/summary.html

Economics of Autonomous and Electric Vehicles

An NBER conference on the Economics of Autonomous and Electric Vehicles took place June 6–7 at Stanford University. Research Associates Susan Athey of Stanford and Ryan Kellogg of the University of Chicago, and Jing Li of MIT organized the meeting, which was sponsored by the Alfred P. Sloan Foundation. These researchers' papers were presented and discussed:

- **Yixuan Liu**, University of Texas at Austin, and **Andrew B. Whinston**, University of Texas, "Resolving Braess's Paradox through Information Design: Routing for Heterogeneous Autonomous Vehicles"
- **Jennifer B. Hatch**, Boston University, and **Will Gorman**, University of California, Berkeley, "GHG Implications of an Autonomous Future"
- **Leslie A. Martin** and **Zan Fairweather**, University of Melbourne, "The Potential Distributional Impacts of Automated Vehicle Technologies"
- **Boyoung Seo**, Indiana University, and **Matthew H. Shapiro**, Singapore Management University, "Minimizing Fleet Emissions through Optimal EV Subsidy Design and Vehicle Replacement"
- **Christopher R. Knittel**, MIT and NBER, and **James M. Sallee**, University of California, Berkeley and NBER, "Vehicle Depreciation and Survival"
- **Avinash Balachandran**, Toyota Research Institute, "Technological Frontiers and Challenges for AV Deployment"
- **Michael Ostrovsky**, Stanford University and NBER, and **Michael Schwarz**, Microsoft, "Carpooling and the Economics of Self-Driving Cars" (NBER Working Paper No. 24349)
- **Stephen P. Holland**, University of North Carolina, Greensboro and NBER; **Erin T. Mansur**, Dartmouth College and NBER; **Nicholas Muller**, Carnegie Mellon University and NBER; and **Andrew J. Yates**, University of North Carolina, Chapel Hill, "The Electric Vehicle Transition and the Economics of Banning Gasoline Vehicles"
- **Zhe Zhang**, University of California, San Diego, and **Beibei Li**, New York University, "Ridesharing, Spatial Frictions, and Urban Consumption Patterns"
- **Federico Boffa** and **Alessandro Fedele**, Free University of Bolzano, and **Alberto Iozzi**, Università di Roma Tor Vergata, "Congestion and Incentives in the Age of Driverless Cars"
- **Avi Chaim Mersky** and **Constantine Samaras**, Carnegie Mellon University, "Impact of Vehicle Automation on Electric Vehicle Charging Infrastructure Siting and Energy Demand"
- **Ginger Zhe Jin**, University of Maryland and NBER, and **Guangyu Cao**, **Xi Weng**, and **Li-An Zhou**, Peking University, "Market Expanding or Market Stealing? Competition with Network Effects in Bike-Sharing" (NBER Working Paper No. 24938)

Summaries of these papers are at www.nber.org/conferences/2019/AEVs19/summary.html

East Asian Seminar on Economics

The NBER's East Asian Seminar on Economics took place June 6–7 in Thailand. Research Associates Takatoshi Ito of Columbia University and Andrew K. Rose of the University of California, Berkeley organized the meeting. These researchers' papers were presented and discussed:

- **Peter K. Schott**, Yale University and NBER; **Andrew Greenland**, Elon University; **Mihai Ion**, University of Arizona; and **John Lopresti**, College of William & Mary, "Using Equity Market Reactions to Infer Exposure to Trade Liberalization"
- **Shujiro Urata**, Waseda University and ERIA; **Kazunobu Hayakawa**, Institute of Developing Economies; and **Tadashi Ito**, Gakushuin University, "Impacts of Increased Chinese Imports on Japan's Labor Market"

- **Minho Kim**, Korea Development Institute, and **Iona Hyojung Lee**, Singapore Management University, "The Impact of Chinese Imports on Korean Manufacturing Plants"
- **Yu-Yin Wu**, **Shih Hui-Tzu**, **Chu-Hsuan Su**, and **Chu-Nan Hu**, Chung-Hua Institution for Economic Research, "Impact of Regional Economic Integration on Taiwan's Industrial Supply Chain of Vehicles"
- **Bingjing Li**, National University of Singapore, and **Loren Brandt** and **Peter Morrow**, University of Toronto, "Is Processing Good? Theory and Evidence from China"
- **Hong Ma**, Tsinghua University, and **Peter Eppinger**, Tubingen University, "Optimal Ownership and Firm Performance: Theory and Evidence from China's FDI Liberalization"
- **Teresa C. Fort** and **Andrew B. Bernard**, Dartmouth College and NBER, and **Frederic Warzynski** and **Valerie Smeets**, Aarhus University, "Heterogeneous Globalization: Offshoring and Reorganization"
- **Edwin Lai**, Hong Kong University of Science and Technology; **Steffan Qi**, Hong Kong Baptist University; and **Heiwai Tang**, Johns Hopkins University, "Global Sourcing and Domestic Value-added in Gross Exports"
- **Yong Wang**, Peking University, and **Shang-Jin Wei**, Columbia University and NBER, "The Sandwich Effect: Challenges for Middle-Income Countries"
- **Toshihiro Okubo**, Keio University, and **Richard Baldwin**, Graduate Institute, Geneva and NBER, "GVC Journeys: Industrialization and Deindustrialization in the Age of the Second Unbundling "
- **Ayako Obashi**, Aoyama Gakuin University, and **Fukunari Kimura**, Keio University, "New Developments in International Production Networks: Impact of Digital Technologies"
- **Rodney Tyers**, Australian National University, and **Yixiao Zhou**, Curtin University, "U.S.-China Rivalry: The Macro Policy Choices"
- **Arnaud Costinot** and **Iván Werning**, MIT and NBER, "Robots, Trade, and Luddism: A Sufficient Statistic Approach to Optimal Technology Regulation" (NBER Working Paper No. 25103)

Summaries of these papers are at www.nber.org/conferences/2019/EASE19/summary.html

International Seminar on Macroeconomics

The NBER's International Seminar on Macroeconomics took place June 27–28 in London. Research Associates Kristin Forbes of MIT and Pierre-Olivier Gourinchas of the University of California, Berkeley organized the meeting, which was hosted by the Bank of England. These researchers' papers were presented and discussed:

- **Ulrike Malmendier**, University of California, Berkeley and NBER; **Demian Pouzo**, University of California, Berkeley; and **Victoria Vanasco**, CREI, "Investor Experiences, Capital Flows and Debt Pricing" (NBER Working Paper No. 24697)
- **François Fontaine**, Paris School of Economics; **Julien Martin**, UQAM; and **Isabelle Mejean**, École Polytechnique, "Price Discrimination Within and Across EMU Markets: Evidence from French Exporters"
- **Shang-Jin Wei**, Columbia University and NBER, and **Yinxi Xie**, Columbia University, "Monetary Policy in a World of Global Supply Chains"
- **Olivier Coibion**, University of Texas, Austin and NBER; **Yuriy Gorodnichenko**, University of California, Berkeley and NBER; **Saten Kumar**, Auckland University of Technology; and **Mathieu Pedemonte**, University of California, Berkeley, "Inflation Expectations as a Policy Tool?" (NBER Working Paper No. 24788)
- **Sergio de Ferra**, Stockholm University; **Kurt Mitman**, Institute for International Economic Studies; and **Federica Romei**, Stockholm School of Economics, "Household Heterogeneity and the Transmission of Foreign Shocks"

- **Chris Redl**, Bank of England, "Uncertainty Matters: Evidence from Close Elections"
- **Nuno T. Coimbra**, Paris School of Economics, "Sovereigns at Risk: A Dynamic Model of Sovereign Debt and Banking Leverage"
- **Julia Bevilaqua**, **Galina Hale**, and **Eric Tallman**, Federal Reserve Bank of San Francisco, "Corporate Spreads, Sovereign Spreads, and Crises"

Summaries of these papers are at www.nber.org/conferences/2019/ISOM19/summary.html

Program and Working Group Meetings

Aging

Members of the NBER's Aging Program met March 29 in Cambridge. Research Associate Kathleen M. McGarry of the University of California, Los Angeles, and Program Director Jonathan S. Skinner of Dartmouth College organized the meeting. These researchers' papers were presented and discussed:

- **Péter Hudomiet** and **Susann Rohwedder**, RAND Corporation, and **Michael D. Hurd**, RAND Corporation and NBER, "The Lifetime Risk of Living with Dementia for Six Months, One, Two, or Five Years"
- **Julie Bynum**, University of Michigan, "The Diagnosis and Prevalence of Alzheimer's Disease and Related Dementias in Clinical Practice"
- **Amitabh Chandra**, Harvard University and NBER, "Innovation and the Economics of Alzheimer's Disease"
- **Amanda E. Kowalski**, University of Michigan and NBER, "Behavior within a Clinical Trial and Implications for Mammography Guidelines" (NBER Working Paper No. 25049)
- **Ryan Brown**, University of Colorado, Denver, and **Duncan Thomas**, Duke University and NBER, "On the Long-term Effects of the 1918 U.S. Influenza Pandemic"
- **Simon Jäger**, MIT and NBER; **Benjamin Schoefer**, University of California, Berkeley; and **Josef Zweimüller**, University of Zurich, "Marginal Jobs and Job Surplus: A Test of the Efficiency of Separations" (NBER Working Paper No. 25492)
- **Jay Bhattacharya**, Stanford University and NBER; **Dean R. Lillard**, Ohio State University and NBER; and **Su H. Shin**, University of Alabama, "Understanding the Correlation between Alzheimer's Disease Polygenic Risk, Wealth, and the Composition of Wealth Holdings" (NBER Working Paper No. 25526)

Summaries of these papers are at www.nber.org/conferences/2019/AGs19/summary.html

Public Economics

Members of the NBER's Public Economics Program met April 4–5 in Cambridge. Program Director Raj Chetty of Harvard University, Research Associate John N. Friedman of Brown University, and Faculty Research Fellow Eric Zwick of the University of Chicago organized the meeting. These researchers' papers were presented and discussed:

- **François Gerard**, Columbia University and NBER, and **Joana Naritomi**, London School of Economics, "Job Displacement Insurance and (the Lack of) Consumption-Smoothing"
- **Jacob Bastian**, University of Chicago, and **Maggie R. Jones**, U.S. Census Bureau, "Do EITC Expansions Pay for Themselves? Effects on Tax Revenue and Public Assistance Spending"
- **Tatiana Homonoff**, New York University, and **Jason Somerville**, Cornell University, "Program Recertification Costs: Evidence from SNAP"
- **Victor Stango**, University of California, Davis, and **Jonathan Zinman**, Dartmouth College and NBER, "We Are All Behavioral, More or Less: Measuring and Using Consumer-level Behavioral Sufficient Statistics" (NBER Working Paper No. 25540)
- **Rebecca Diamond** and **Petra Persson**, Stanford University and NBER; **Michael J. Dickstein**, New York University and NBER; and **Timothy McQuade**, Stanford University, "Take-Up, Drop-Out, and Spending in ACA Marketplaces" (NBER Working Paper No. 24668)
- **Shifrah Aron-Dine**, Stanford University; **Aditya Aladangady**, **David Cashin**, **Wendy Dunn**, **Laura Feiveson**, **Paul Lengermann**, and **Claudia R. Sahm**, Federal Reserve Board; and **Katherine Richard**, University of Michigan, "High-frequency Spending Responses to the Earned Income Tax Credit "
- **Paul Hufe**, Ifo Institute for Economic Research; **Ravi Kanbur**, Cornell University; and **Andreas Peichl**, University of Munich, "Measuring Unfair Inequality: Reconciling Equality of Opportunity and Freedom from Poverty"
- **Bruce D. Meyer**, University of Chicago and NBER, and **Derek Wu** and **Victoria D. Mooers**, University of Chicago, "The Use and Misuse of Income Data and the Rarity of Extreme Poverty in the United States"
- **Alisa Tazhitdinova**, University of California, Santa Barbara, "Increasing Hours Worked: Moonlighting Responses to a Large Tax Reform"
- **Maria Polyakova**, Stanford University and NBER, and **Stephen P. Ryan**, Washington University in St. Louis and NBER, "Subsidy Targeting with Market Power"
- **Marta Murray-Close** and **Misty L. Heggeness**, U.S. Census Bureau, "Manning Up and Womaning Down: How Husbands and Wives Report Their Earnings When She Earns More"
- **Daniel W. Sacks** and **Bradley Heim**, Indiana University, and **Ithai Lurie**, Department of the Treasury, "Does the Individual Mandate Affect Insurance Coverage? Evidence from the Population of Tax Returns"
- **John N. Tsivanidis**, Dartmouth College, "The Aggregate and Distributional Effects of Urban Transit Infrastructure: Evidence from Bogotá's TransMilenio"

Summaries of these papers are at www.nber.org/conferences/2019/PEs19/summary.html

Asset Pricing

Members of the NBER's Asset Pricing Program met April 12 in Chicago. Research Associates Janice C. Eberly and Konstantin Milbradt, both of Northwestern University, organized the meeting. These researchers' papers were presented and discussed:

- **Ian Dew-Becker**, Northwestern University and NBER, and **Stefano Giglio**, and **Bryan T. Kelly**, Yale University and NBER, "Hedging Macroeconomic and Financial Volatility and Uncertainty"
- **Lubos Pastor** and **Pietro Veronesi**, University of Chicago and NBER, "Inequality Aversion, Populism, and the Backlash against Globalization" (NBER Working Paper No. 24900)
- **Robin Greenwood**, Harvard University and NBER, and **Annette Vissing-Jorgensen**, University of California, Berkeley and NBER, "The Impact of Pensions and Insurance on Global Yield Curves"
- **Grace Xing Hu**, University of Hong Kong; and **Jun Pan**, **Jiang Wang**, and **Haoxiang Zhu**, MIT and NBER, "Premium for Heightened Uncertainty: Solving the FOMC Puzzle"
- **Robert Novy-Marx**, University of Rochester and NBER, and **Mihail Z. Velikov**, Federal Reserve Bank of Richmond, "Betting Against Betting Against Beta"
- **Sung Je Byun**, Federal Reserve Bank of Dallas, and **Lawrence Schmidt**, MIT, "Real Risk or Paper Risk? Mis-measured Factors, Granular Measurement Errors, and Empirical Asset Pricing Tests"

Summaries of these papers are at www.nber.org/conferences/2019/APs19/summary.html

Education

Members of the NBER's Education Program met April 11–12 at Stanford University. Program Director Caroline M. Hoxby of Stanford University organized the meeting. These researchers' papers were presented and discussed:

- **Andrew Morgan**, **Minh Nguyen**, and **Ben Ost**, University of Illinois at Chicago; **Eric A. Hanushek**, Stanford University and NBER; and **Steven G. Rivkin**, University of Illinois at Chicago and NBER, "Getting Effective Educators in Hard-to-Staff Schools"
- **C. Kirabo Jackson** and **Laia Navarro-Sola**, Northwestern University, and **Diether Beuermann** and **Francisco Pardo**, Inter-American Development Bank, "What is a Good School, and Can Parents Tell? Evidence on the Multidimensionality of School Output" (NBER Working Paper No. 25432)
- **Sarah Cohodes**, Columbia University and NBER; **Elizabeth Setren**, Tufts University; and **Christopher R. Walters**, University of California, Berkeley and NBER, "Can Successful Schools Replicate? Scaling Up Boston's Charter School Sector"
- **Hessel Oosterbeek**, **Sandor Sovago**, and **Bas van der Klaauw**, Vrije Universiteit, Amsterdam, "Why are Schools Segregated? Evidence from the Secondary-School Match in Amsterdam"
- **Jeffrey T. Denning**, **Eric R. Eide**, and **Merrill Warnick**, Brigham Young University, "Why Have College Completion Rates Increased?"
- **Ulf Zoelitz**, University of Zurich, and **Ingo E. Isphording**, IZA Bonn, "The Value of a Peer — A New Way to Quantify Individual Spillovers"
- **Mauricio Romero**, ITAM; **Justin Sandefur**, Center for Global Development; and **Wayne A. Sandholtz**, University of California, San Diego, "Outsourcing Service Delivery in a Fragile State: Experimental Evidence from Liberia"
- **Ying Shi**, Stanford University, and **John D. Singleton**, University of Rochester, "Expertise and Independence on Governing Boards: Evidence from School Districts"

- **Tarek Azzam**, Claremont Graduate University, and **Michael D. Bates** and **David Fairris**, University of California, Riverside, "Do Learning Communities Increase First Year College Retention? Testing the External Validity of Randomized Control Trials"
- **James Berry**, University of Delaware; **Rebecca Dizon-Ross**, University of Chicago and NBER; and **Maulik Jagnani**, Cornell University, "(Not) Playing Favorites: An Experiment on Parental Preferences for Educational Investment"
- **Krzysztof Karbownik**, Northwestern University, and **Umut Özek**, American Institutes for Research, "Setting a Good Example? Examining Sibling Spillovers in Educational Achievement Using Regression Discontinuity Design"
- **Kendall J. Kennedy**, Mississippi State University, "Hidden Schooling: Repeated Grades and the Returns to Education and Experience"

Summaries of these papers are at www.nber.org/conferences/2019/EDs19/summary.html

Organizational Economics

Members of the NBER's Organizational Economics Working Group met April 12–13 in Cambridge. Research Associate Robert S. Gibbons of MIT organized the meeting. These researchers' papers were presented and discussed:

- **Andrea Prat**, Columbia University; **Michael C. Best**, Columbia University and NBER; and **Adnan Khan** and **Oriana Bandiera**, London School of Economics, "Incentives and the Allocation of Authority in Organizations: A Field Experiment with Bureaucrats"
- **Devesh Rustagi**, Goethe University Frankfurt, "Waiting for Napoleon? Historical Democracy and Norms of Cooperation"
- **Mitchell Hoffman**, University of Toronto and NBER; **Guido Friebel** and **Nick Zubanov**, Goethe University Frankfurt; and **Matthias Heinz**, University of Cologne, "What Do Employee Referral Programs Do?"
- **Guo Xu**, University of California, Berkeley; **Marianne Bertrand**, University of Chicago and NBER; and **Robin Burgess**, London School of Economics, "Social Proximity and Bureaucrat Performance: Evidence from India" (NBER Working Paper No. 25389)
- **Daniel V. Barron** and **Yingni Guo**, Northwestern University, "The Use and Misuse of Coordinated Punishments"
- **Oliver D. Hart**, Harvard University and NBER, and **David Frydlinger**, Cirio Law Firm, "Overcoming Contractual Incompleteness: The Role of Guiding Principles"
- **Daniela Scur**, MIT, and **Renata Lemos**, The World Bank, "The Ties That Bind: Family CEOs, Management Practices and Firing Costs"
- **Christian Zehnder**, University of Lausanne; **Ernst Fehr**, University of Zurich; and **Oliver D. Hart**, Harvard University and NBER, "Contracts, Conflicts and Communication"
- **Christopher Cornwell** and **Ian M. Schmutte**, University of Georgia, and **Daniela Scur**, MIT, "Picking from the Top or Shedding the Bottom? Personnel Management, Worker Quality and Firm Productivity"
- **Monica Martinez-Bravo**, Centro de Estudios Monetarios y Financieros (CEMFI); **Gerard Padró I Miquel**, Yale University and NBER; **Nancy Qian**, Northwestern University and NBER; and **Yang Yao**, Peking University, "The Rise and Fall of Local Elections in China: Theory and Empirical Evidence on the Autocrat's Trade-off" (NBER Working Paper No. 24066)

- **Melanie Meng Xue**, Northwestern University, and **Mark Koyama**, George Mason University, "Autocratic Rule and Social Capital: Evidence from Imperial China"
- **Heikki Rantakari**, University of Rochester, "Simon Says? (Interpersonal) Authority in Organizations"

Summaries of these papers are at www.nber.org/conferences/2019/OEs19/summary.html

Corporate Finance

Members of the NBER's Corporate Finance Program met April 12 in Chicago. Research Associates Andrea L. Eisfeldt of the University of California, Los Angeles and Victoria Ivashina of Harvard University organized the meeting. These researchers' papers were presented and discussed:

- **Antonio Falato, Diana Iercosan,** and **Filip Zikes**, Federal Reserve Board, "Banks as Regulated Traders"
- **Zhengyang Jiang**, Northwestern University, and **Arvind Krishnamurthy** and **Hanno Lustig**, Stanford University and NBER, "Dollar Safety and the Global Financial Cycle"
- **C. Fritz Foley**, Harvard University and NBER; **Agustin M. Hurtado**, University of Chicago; **Andres Liberman**, New York University; and **Alberto Sepulveda**, SBIF, "The Effects of Information on Credit Market Competition: Evidence from Credit Cards"
- **Joshua L. Krieger**, Harvard University; **Danielle Li**, MIT and NBER; and **Dimitris Papanikolaou**, Northwestern University and NBER, "Missing Novelty in Drug Development" (NBER Working Paper No. 24595)
- **Shai Bernstein** and **Rebecca Diamond**, Stanford University and NBER, and **Timothy McQuade** and **Beatriz Pousada**, Stanford University, "The Contribution of High-Skilled Immigrants to Innovation in the United States"
- **Jason R. Donaldson**, Washington University in St Louis; **Denis Gromb**, INSEAD; and **Giorgia Piacentino**, Columbia University, "Conflicting Priorities: A Theory of Covenants and Collateral"
- **Christopher A. Parsons**, University of Washington; **Casey Dougal**, Drexel University; and **Sheridan Titman**, University of Texas at Austin and NBER, "Urban Vibrancy and Value Creation"
- **Xavier Gabaix**, Harvard University and NBER, and **Ralph S. J. Koijen**, University of Chicago and NBER, "Granular Instrumental Variables"

Summaries of these papers are at www.nber.org/conferences/2019/CFs19/summary.html

Behavioral Finance

Members of the NBER's Behavioral Finance Working Group met April 12–13 in Chicago. Research Associate Nicholas C. Barberis of Yale University organized the meeting. These researchers' papers were presented and discussed:

- **Niels Joachim Gormsen**, University of Chicago, and **Eben Lazarus**, MIT, "Expected Returns and Cash-Flow Growth"
- **Stefano Giglio**, Yale University and NBER; **Matteo Maggiori**, Harvard University and NBER; **Johannes Stroebel**, New York University and NBER; and **Stephen Utkus**, Vanguard, "Five Facts About Beliefs and Portfolios" (NBER Working Paper No. 25744)
- **Can Gao**, Imperial College London, and **Ian Martin**, London School of Economics, "Volatility, Valuation Ratios, and Bubbles: An Empirical Measure of Market Sentiment"

- **Klakow Akepanidtaworn**, University of Chicago; **Rick Di Mascio**, Inalytics Ltd.; **Alex Imas**, Carnegie Mellon University; and **Lawrence Schmidt**, MIT, "Selling Fast and Buying Slow: Heuristics and Trading Performance of Institutional Investors"
- **Jordan Brooks** and **Michael Katz**, AQR Capital Management, and **Hanno Lustig**, Stanford University and NBER, "Post-FOMC Announcement Drift in U.S. Bond Markets" (NBER Working Paper No. 25127)
- **Jessica Wachter**, University of Pennsylvania and NBER, and **Michael J. Kahana**, University of Pennsylvania, "A Retrieved-Context Theory of Financial Decisions"

Summaries of these papers are at www.nber.org/conferences/2019/BFs19/summary.html

Political Economy

Members of the NBER's Political Economy Program met April 26 in Cambridge. Program Director Alberto F. Alesina of Harvard University organized the meeting. These researchers' papers were presented and discussed:

- **James J. Feigenbaum**, Boston University and NBER, and **Daniel Thompson**, **Andrew B. Hall**, and **Jesse Yoder**, Stanford University, "Who Becomes a Member of Congress? Evidence From De-Anonymized Census Data"
- **Elhanan Helpman**, Harvard University and NBER, and **Gene M. Grossman**, Princeton University and NBER, "Identity Politics and Trade Policy" (NBER Working Paper No. 25348)
- **Lubos Pastor** and **Pietro Veronesi**, University of Chicago and NBER, "Inequality Aversion, Populism, and the Backlash against Globalization" (NBER Working Paper No. 24900)
- **Matthew Jackson**, Stanford University, and **Yiqing Xing**, Johns Hopkins University, "The Complementarity between Community and Government in Enforcing Norms and Contracts, and their Interaction with Religion and Corruption"
- **Francesco Giavazzi**, Bocconi University and NBER; **Giacomo Lemoli**, New York University; and **Felix Iglhaut** and **Gaia Rubera**, Bocconi University, "Terrorist Attacks, Cultural Incidents, and the Vote for Radical Parties"
- **Melanie Wasserman**, University of California, Los Angeles, "Gender Differences in Politician Persistence"

Summaries of these papers are at www.nber.org/conferences/2019/POLs19/summary.html

Cohort Studies

Members of the NBER's Cohort Studies Working Group met April 26–27 in Cambridge. Research Associate Dora Costa of the University of California, Los Angeles organized the meeting, which was sponsored by the National Institute on Aging. These researchers' papers were presented and discussed:

- **Nicola Barban** and **Marco Francesconi**, University of Essex, and **Elisabetta De Cao**, London School of Economics, "Basic Instincts? The Role of Gene-Environment Interactions in Female Fertility Behavior"
- **Prashant Bharadwaj**, University of California, San Diego and NBER, and **Arushi Kaushik** and **Gordon McCord**, University of California, San Diego, "Intergenerational Effects of the Bhopal Gas Disaster"
- **Dora Costa**, "Update on Ex-POW Trauma and Intergenerational Transmission"
- **Janice Compton**, University of Manitoba, and **Robert A. Pollak**, Washington University in St. Louis and NBER, "The Life Expectancy of Older Couples and Surviving Spouses"

- **Ashley M. Ima**, Chapman University, and **Tim A. Bruckner**, **Trang T. Nguyen**, and **Andrew Noymer**, University of California, Irvine, "Race and Life Expectancy in the United States in the Great Depression"
- **Gabriella Conti**, University College London; **Govert E. Bijwaard**, **Peter Ekamper**, and **Frans van Poppel**, NIDI; and **Lambert Lumey**, Columbia University, "Impact of Famine Exposure In Utero on Labor Market Behavior and Health Later in Life"
- **Kasey Buckles**, University of Notre Dame and NBER; **Joseph Price**, Brigham Young University and NBER; and **Isaac Riley** and **Jacob R. Van Leeuwen**, Brigham Young University, "Combining Family History and Machine Learning to Link Historical Records"
- **Gabriella Conti** and **Stavros Poupakis**, University College London; **Peter Ekamper**, **Govert E. Bijwaard**, and **Frans van Poppel**, NIDI; and **Lambert Lumey**, Columbia University, "Health Effects of In Utero Exposure to the Dutch Hunger Winter"
- **Yiqun Chen**, Stanford University, and **Petra Persson** and **Maria Polyakova**, Stanford University and NBER, "The Roots of Health Inequality and the Value of Intra-Family Expertise" (NBER Working Paper No. 25618)
- **Jamie M. Carroll**, **Chandra Muller**, and **Alicia Duncombe**, University of Texas, Austin; **Eric Grodsky**, University of Wisconsin; **Anna S. Mueller**, University of Chicago; and **John Robert Warren**, University of Minnesota, "Preparing for an Uncertain Economy: How Occupational Expectations, Educational Attainment, and Labor Market Fluctuations Predict Death by Suicide and Substance Abuse by Midlife"
- **Jesse Rothstein**, University of California, Berkeley and NBER, "The Lost Generation? Scarring after the Great Recession"
- **Lambert Lumey**, Columbia University; **Gabriella Conti**, University College London; and **Peter Ekamper**, **Govert Bijwaard**, and **Frans van Poppel**, NIDI, "Overweight and Obesity in Young Men after Famine Exposure In Utero and Early Infancy: A Re-Examination"
- **Bastiaan T. Heijmans** and **Elmar W. Tobi**, Leiden University Medical Center, and **Lambert Lumey**, Columbia University, "Exploring Epigenetic Mechanisms for the Long-term Health Impact of the Dutch Famine of 1944–45"

Summaries of these papers are at www.nber.org/conferences/2019/CSs19/summary.html

Health Economics

Members of the NBER's Health Economics Program met April 26 in Cambridge. Program Director Michael Grossman of the City University of New York and Research Associates Christopher Carpenter of Vanderbilt University and Robert Kaestner of University of Chicago organized the meeting. These researchers' papers were presented and discussed:

- **Alice Zulkarnain** and **Matthew S. Rutledge**, Boston College, "Does Delayed Retirement Affect Mortality?"
- **Lawrence Jin** and **Nicolas R. Ziebarth**, Cornell University, "Sleep, Health, and Human Capital: Evidence from Daylight Saving Time"
- **Marianne Bitler,** University of California, Davis and NBER; **Janet Currie,** Princeton University and NBER; **Hilary W. Hoynes,** University of California, Berkeley and NBER; **Lisa Schulkind,** University of North Carolina, Charlotte; and **Barton Willage,** Louisiana State University, "The Impact of Childhood Nutrition Assistance on Child Health and Well-Being: Lessons from WIC"
- **Peter A. Savelyev,** College of William and Mary; **Benjamin C. Ward,** University of Georgia; and **Robert Krueger** and **Matt F. McGue,** University of Minnesota, "Health Endowments, Schooling Allocation in the Family, and Longevity: Evidence from U.S. Twins"

- **Jason Fletcher,** University of Wisconsin-Madison and NBER, and **Qiongshi Lu,** University of Wisconsin-Madison, "Health Policy and Genetic Endowments: Understanding Sources of Response to MLDA Laws"

- **Willa H. Friedman,** University of Houston, and **Anthony Keats,** Wesleyan University, "Disruptions to Health Care Quality and Early Child Health Outcomes: Evidence from Health Worker Strikes"

Summaries of these papers are at www.nber.org/conferences/2019/HEs19/summary.html

Children

Members of the NBER's Program on Children met May 2–3 in Cambridge. Program Directors Anna Aizer of Brown University and Janet Currie of Princeton University organized the meeting. These researchers' papers were presented and discussed:

- **Maria Micaela Sviatschi**, Princeton University, and **Iva Trako**, World Bank, "Female Officers, Gender Violence and Children: Evidence from Women's Justice Centers in Peru"

- **Giuseppe Sorrenti** and **Ulf Zoelitz**, University of Zurich, "The Causal Impact of Socio-Emotional Skills Training on Educational Success"

- **Andrew C. Barr**, Texas A&M University, and **Alexander A. Smith**, United States Military Academy, "The Effect of Income During Infancy: Evidence from the EITC"

- **Anthony Bald** and **Margarita Machelett**, Brown University; **Eric Chyn**, University of Virginia; and **Justine S. Hastings**, Brown University and NBER, "The Causal Impact of Removing Children from Abusive and Neglectful Homes" (NBER Working Paper No. 25419)

- **Jonathan M. Colmer**, University of Virginia, and **John L. Voorheis**, U.S. Census Bureau, "Pollution and the Intergenerational Transmission of Human Capital: Evidence from the 1970 Clean Air Act"

- **Natalie Bau**, University of California, Los Angeles; **Martin Rotemberg**, New York University; **Manisha Shah**, University of California, Los Angeles and NBER; and **Bryce Steinberg**, Brown University and NBER, "Brain vs. Brawn: Child Labor, Human Capital Investment, and the Role of Dynamic Complementarities"

- **Bahadir Dursun**, Princeton University; **Ozkan Eren**, University of California, Riverside; and **My T. Nguyen**, Louisiana State University, "Curriculum Reforms and Infant Health"

- **Anne Karing**, University of California, Berkeley, "Social Signaling and Childhood Immunization: A Field Experiment in Sierra Leone"

- **Jonas Lau-Jensen Hirani**, University of Copenhagen; **Hans Henrik Sievertsen**, University of Bristol; and **Miriam Wüst**, University of Copenhagen and the Danish Center for Social Science Research, "Beyond Treatment Exposure: The Timing of Early Interventions and Children's Health"

- **Anne Ardila Brenoe**, University of Zurich, "Brothers Increase Women's Gender Conformity"

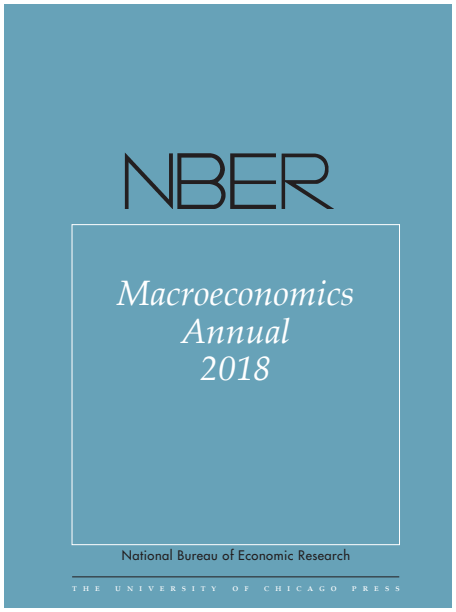
- **Kasey Buckles**, University of Notre Dame and NBER; **Melanie E. Guldi**, University of Central Florida; and **Lucie Schmidt**, Williams College and NBER, "Fertility Trends in the United States, 1980–2017: The Role of Unintended Births" (NBER Working Paper No. 25521)

Summaries of these papers are at www.nber.org/conferences/2019/CHs19/summary.html

NBER Books

NBER Macroeconomics Annual 2018, Volume 33

Edited by Martin Eichenbaum and Jonathan A. Parker
https://press.uchicago.edu/ucp/books/book/distributed/N/bo41210957.html



This volume contains six studies on current topics in macroeconomics. Michael Woodford shows that while the assumption of rational expectations is unrealistic, a finite-horizon forward planning model can generate results similar to those of a rational expectations equilibrium. Andrew Atkeson, Adrien d'Avernas, Andrea Eisfeldt, and Pierre-Olivier Weill investigate whether the U.S. financial sector is safer than it was before the financial crisis and examine the ratio of market-to-book values of banks. Loukas Karabarbounis and Brent Neiman study alternative ways to allocate output that are not associated with either capital or labor, what they call "factorless income." Julian Kozlowski, Laura Veldkamp, and Venky Venkateswaran argue that the financial crisis increased perceived tail risk and led to higher demand for safe, risk-free, liquid assets. They also explore the propagation of large, rare shocks. Kerwin Kofi Charles, Erik Hurst, and Mariel Schwartz document substantial changes in the manufacturing sector and the decline in employment among prime-aged Americans since 2000, and assess the relative effects of trade, and worker health and mobility. Omar Barbiero, Emmanuel Farhi, Gita Gopinath, and Oleg Itskhoki analyze the dynamic macroeconomic effects of border adjustment taxes, considering them both in the context of corporate tax reform and as a part of the value-added tax.

Tax Policy and the Economy, Volume 33

Edited by Robert A. Moffitt
https://press.uchicago.edu/ucp/books/book/distributed/T/bo41210992.html

This volume presents five new studies on taxation and government transfer programs. Scott Baker, Lorenz Kueng, Leslie McGranahan, and Brian Melzer explore whether "unconventional" fiscal policy in the form of pre-announced consumption tax changes can shift durables purchases intertemporally, and how such shifts are affected by consumer credit. Michelle Hanlon, Jeffrey Hoopes, and Joel Slemrod examine the effects of the Tax Cuts and Jobs Act on corporation behavior and on firms' statements about their behavior. They focus on four outcomes: bonuses, investment, share repurchases, and dividends. Alan Auerbach discusses "tax equivalences" — disparate sets of policies that have the same economic effects — and also illustrates when these equivalences break down. Jeffrey Liebman and Daniel Ramsey use data from NBER's TAXSIM model to investigate the equity implications of a switch from joint to independent taxation that could occur in conjunction with adoption of return-free tax filing. Alexander Blocker, Laurence Kotlikoff, Stephen Ross, and Sergio Villar Vallenas show how asset pricing can be used to value implicit fiscal debts, which are currently rarely measured or adjusted for risk, while accounting for risk properties. They apply their methodology to study Social Security.

NBER Reporter
NATIONAL BUREAU OF ECONOMIC RESEARCH

1050 Massachusetts Avenue
Cambridge, Massachusetts 02138-5398
(617) 868-3900

Change Service Requested

Nonprofit Org.
U.S. Postage
PAID
National Bureau of
Economic Research