Development Economics Program

Duncan Thomas*

Identifying what actually works to reduce poverty and improve population well-being is a key challenge in development economics. When something is thought to work, the next challenge is determining why it works and the conditions under which it works; that is, assessing the extent to which conclusions are generalizable. These are key research themes in the Development Economics Program.

One exciting source of new results on these questions arises from a multifaceted, focused initiative known as the “Graduation” Program. This program, developed by BRAC, a large NGO formerly known as the Bangladesh Rural Advancement Committee, was designed to provide the poorest people with a sustainable pathway out of extreme poverty. The program provides resources to address participants’ immediate needs and longer-term investments, with the goal of building sustainable livelihoods. The Graduation Program has three central planks designed to provide a holistic set of resources and services to increase the productivity of the ultra-poor: a grant to acquire productive assets, access to a savings account, and two years of training and support, including life skills coaching.

To investigate how well the program works, Abhijit Banerjee, Esther Duflo, Nathanael Goldberg, Dean Karlan, Robert Osei, William Parienté, Jeremy Shapiro, Bram Thuysbaert, and Christopher R. Udry conducted an ambitious set of coordinated randomized controlled trials (RCTs) in villages in Ethiopia, Ghana, Honduras, India, Pakistan, and Peru. They identified the poorest households in each study village and randomly offered about half of them the BRAC program, with the other households serving as controls. The program was a stunning success, as measured by a very large and broad set of markers of well-being.

At the end of the intervention, which lasted two years, relative

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to controls, Graduation Program households reported higher levels of per capita consumption, more income, greater savings, more assets and improved mental health. Effects were not only large and statistically significant, but also long-lived, persisting for at least a year after the intervention ended in all the study settings and in India for at least another four years.

Figure 1 illustrates estimates of the magnitude of some of the average standardized treatment effects two years after the start of the program in the six countries. Based on this evidence, many countries are currently experimenting with this type of multifaceted package as they endeavor to reduce persistent poverty.

New Thinking about Poverty Alleviation Strategies

The study clearly establishes that the Graduation Program has transformed the lives of the poorest not just in one small area but across vastly different settings over three continents. This is important because many of the most promising anti-poverty programs that have been documented to date have not been successful in some contexts. The program has demonstrated that microcredit can be a powerful tool for poverty reduction and, perhaps more importantly, that it can be a powerful tool for poverty reduction.

Microcredit is one example of an anti-poverty strategy that has been extensively analyzed. In 2006, the Nobel Peace Prize was awarded to Muhammad Yunus and Grameen Bank for leading the microcredit revolution that brought small loans to the poor in Bangladesh, and then to the poor in other countries. Microcredit, which is made mostly to women, involves small loans that are repaid as a lump sum after the harvest, with interest. It is possible that microcredit loans are too small and too short-term to have a sustained impact on the lives of the recipients. This was investigated in a clever RCT conducted in rural Mali by Lotti Beaman, Kathrin Thunbaeb, and Udry that provided capital to farmers at the beginning of the planting season to be repaid as a lump sum after the harvest. About half the study villages were assigned to participate in a loan program. Women in those villages were able to form associations and apply for loans. After all loan decisions had been made, a random sub-sample of the women living in the same villages who did not borrow were given cash grants. In the other villages, randomly selected households were given a cash grant — the first plunk of the Graduation Program. Those who received cash grants significantly increased their investments and net revenue on their farms. In contrast, in the villages where loans were available, the farmers who borrowed increased their investments and revenue even more, whereas there was no significant increase among the cash grant recipients in these villages. The researchers then randomly assigned some of the women to participate in the Graduation Program, while others did not.

Figure 1 illustrates conclusions. This involves research that has taken a structural approach to modelling credit constraints, income uncertainity, and lumpy investments, exploiting quasi-experimental variation in microcredit programs in Southeast Asia. Overall, estimated impacts of microcredit have been mixed, at best, and the outcomes over lend insight into the microcredit revolution, but also illustrate the difficulties of evaluating such programs in practice.


The Development Economics Program

The Development Economics Program, the youngest NBER program, was formed in 2012 to bring together scholars working on fundamental questions related to economic development and the behavior of individuals, families, firms, and institutions in developing countries. Program researchers undertake a wide array of studies to improve understanding of economic growth and productivity, poverty, inequality, and population well-being across the globe. Of about 125 program members, nearly three-quarters also are affiliated with other NBER programs; Development Economics is the primary affiliation for about half the program members. This reflects both the breadth of development economics within the economics discipline and the fact that many of the central questions in development are also major questions in other areas of economics. One of the key benefits of the Development Economics Program is the unparalleled opportunity to integrate cutting-edge research across fields within economics and to develop productive cross-field collaborations that yield new insights into some of the most important issues of our day. The program has had to increase its funding in order to attract the number of exceptionally talented young economists working in the field. About half of program affiliates received their PhD in the last 10 years.

Program initiatives are supported by an active advisory committee with a broad and changing membership. Current and past advisory committee members include Abhijit Banerjee, Esther Duflo, Andrew Foster, Penny Goldberg, Chiang-Tai Hu, Eliaana La Ferrara, Dilip Mookherjee, Benjamin Olken, and Christopher Udry. The program has collaborated with the Bureau for Research and Economic Analysis of Development (BREAD), which was well-established when the program was launched. While NBER affiliates must have primary academic appointments in North America, BREAD includes researchers with both academic and non-academic appointments globally. Joint meetings therefore provide a valuable breadth of perspectives. Every other year, the program and BREAD have held well-attended, productive joint meetings.
The weight of the evidence, then, indicates that while credit is a powerful tool for combatting widespread poverty at the population level, it is also important to underscore that, in all of these studies, trainees are self-selected in one way or another; evidence on the impact of non-targeted training programs is much more mixed.

An important point of this literature is that credit is a powerful tool for poverty alleviation for a selected group of people, credit alone is not sufficient to combat widespread poverty at the population level.

While effects were larger for young males relative to females in this Colombian program, other studies report the reverse. In a study in the Dominican Republic that included an intensive treatment of hard and soft skill training as well as an internship, Paloma Accevedo, Guillermo Crues, Paul Gertler, and Sebastian Martinez found that the lives of females were transformed by the training. In contrast, females make the training raised expectations that were subsequently dashed, and there were no measurable long-term benefits.

Indeed, studies underscore the point that several features of rural markets and some of the policies intended to help the poor in fact exacerbate poverty. For example, using data from 600 Indian districts over 50 years, Supreet Kaur establishes that nominal wages rise in response to higher than normal levels of rainfall but do not adjust downside later, and nominal wages do not fall during droughts. She estimates that demand for landless rural dwellers, who are also non-wage workers, is 9 percent lower than it would be if wages were flexible. The poor pay a heavy penalty for this wage rigidity, which apparently is sustained by beliefs on the parts of both workers and employers that nominal wage cuts are unfair and result in reduced effort.

Uncertainty plays a central role in agricultural decision-making, with weather at the heart of much of that uncertainty. Unwanted weather risks are a major source of welfare loss although, as pointed out by Jing Cai, Alain de Janvry, and Elisabeth Sadoulet, weather insurance products typically face how take-up rates by farmers. What are the impacts of these products? Studies have shown that when farmers buy weather-based insurance, agricultural output and labor demand are more sensitive to weather because farmers switch to riskier, higher-yield production methods. This point is made by Ahmed Mobarak and Rosenzweig, who examine the general equilibrium implications on labor market outcomes of offering insurance to both farmers and to landless workers. When agricultural laborers are offered insurance, their labor supply responses result in wages being smoothed across weather states. When farmers who own land are offered insurance, their incomes benefit, but the insurance exacerbates the variance of weather shocks on the wages of landless laborers—the poorest of the poor—and makes them worse off than they would be in a world without insurance.

In a similar vein, Rosenzweig and Udry focus on the quality of rainfall forecasts in rural India and show that weather forecasts affect farmer investment decisions, particularly in areas where forecasts are more reliable, which results both in higher profits and in more-variable profits. Moreover, a forecast of good weather lowers out-migration from the farming area, which reduces wages and improves labor allocations, other things being equal. However, if the forecast turns out to be wrong, equilibrium wages are further reduced, resulting in greater volatility than would have been the case in the absence of weather forecasts.

The researchers conclude that improvements in the quality of rainfall forecasts would be especially beneficial for landless workers and farmers in the poorest of the poor.
in weather forecasting will benefit both farmers and landless laborers. More generally, while migration has played an important role in mitigating spatial misallocation of factors in developing economies, large productivity gaps across sectors persist. For example, Gharad Bryan and Melanie Morten estimate that labor productivity would increase by 22 percent in Indonesia if barriers to its limits to expansion in long literature in development has shown that migration provides insurance. Morten estimates a structural model using panel data from India to investigate the links between migration and insurance, distinguishing informal, collective risk-sharing and self-insurance. She concludes that improving access to risk-sharing reduces temporary migration by 20 percentage points while reducing the cost of migration reduces collective risk-sharing by 8 percentage points. An innovative experimental study conducted by Mohan explains why so many small firms in developing countries and firms the growth of small firms in developing countries? McKenzie and Woodruff conducted surveys of managers in small firms in Bangladesh, China, Ghana, Kenya, Mexico, Nigeria, and Sri Lanka. They conclude that profits and productivity are higher in firms with better business practices and that the better-educated and the children of entrepreneurs are more likely to employ these practices.

Political Economy of Institutions

It is difficult to overstate the importance of institutions in development. As Duflo points out, drawing insights from economics to improve both the design and development of institutions will likely contribute to the field of implementation science and yield high returns for society. Frederico Finan, Olken, and Pande emphasize this point, noting that public sector employees tend to earn more than they would in the private sector, particularly in contexts where concerns about governance quality are most severe. They point to the importance of taking into account the roles of incentives, incentive structures, and monitoring of public sector workers in the design of programs and policies as well as the time of recruitment and election. As Duflo, Greenstone, Pandolfo, and Nicholas Ryan document, the costs of corruption can be huge. They show that changing the incentives of third-party environment auditors in India to reduce corruption results in plant emissions not only being reported correctly but also in substantial reductions in poisonous emissions. Leakage from public programs to local public officials is an enduring concern, particularly in very large and decentralized programs. Return to Text


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What are the key limiting factors that constrain the growth of small firms in developing countries? McKenzie and Woodruff conducted surveys of managers in small firms in Bangladesh, China, Ghana, Kenya, Mexico, Nigeria, and Sri Lanka. They conclude that profits and productivity are higher in firms with better business practices and that the better-educated and the children of entrepreneurs are more likely to employ these practices.

Entrepreneurship, Firms, and the Self-Employed

Turning to the non-agricultural sector, a long-standing theme in the “missing middle” of mid-sized firms in developing countries. Many studies have sought to understand why so many small firms in these countries do not grow. As Chang-Tai Hsieh and Benjamin Olken point out, however, it is not just mid-sized firms but also large firms that are missing. They document that, as is the case for firms in the rural sector, a very large fraction of the growth of firms in developing countries. However, in contrast to agriculture, small firms have low levels of productivity relative to larger firms and they conclude that it is larger firms that face binding capital or labor constraints. This is consistent with some of the evidence from India to microenterprises. For example, Karlan, Ryan Knight, and Udry conduct an experiment in Ghana that provides financial capital (a cash grant) and managerial capital (consulting services) to microenterprises. While entrepreneurs invest the cash and take the advice, their profits dwindle and they revert to their prior practices.

A contrasting study of Ghanaian microenterprises by Marcel Fafchamps, David McKenzie, Simon Quinn, and Christopher Woodruff finds that, in the case of females, in-kind services raise profits but cash grants have no impact, while firm-level labor productivity improves in kind services positively impact profits. Microenterprises tend to be operated by households and, as Aricile Bernhardt, Erica Field, Rohini Pandi, and Natalie Rigol point out, the failure to carefully separate the activities of husbands and wives leads to incorrect inferences about the productivity of female entrepreneurs. They conducted a randomized trial with female micro-entrepreneurs in India in which microfinance repayment constraints were relaxed by providing a grace period to the treatment group. They find that those of households engaged in micro enterprises who are taken together, rose substantially for the group that received the grace period. When there were multiple enterprises in a household, repayment was allocated to the most profitable enterprise, which was often managed by the husband. Moreover, when the only enterprise in the household belonged to the wife, the total amount allocated to her enterprise rose. They find similar patterns in the Ghanaian data used by Fafchamps and colleagues as well as in data from an earlier Sri Lankan study and conclude that when capital is provided to a household member, household-level income gains are equivalent regardless of the recipient of the grant or loan.

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Segregation by race is a central and persistent characteristic of American cities, and there is a broad consensus among economists that this spatial separation of racial groups is a key driver of socioeconomic outcomes for urban Americans. Researchers have documented that segregation contributes to poverty, adverse educational outcomes, and reduced intergenerational mobility.

These findings naturally give rise to a focus on the origins of segregation. Attention has concentrated on three potential mechanisms: uncoordinated individual behavior, collective group action, and policy, all of which have the potential to overlap and mutually reinforce one another.

In this research report, we describe our work on the rise of segregation in pre-World War II American cities. We focus on the early 20th century period during which black ghettos were established or consolidated in most northern urban areas. The decades from 1900 to 1930 saw the largest increases in measured segregation of the century, as black migration from the South accelerated due to a combination of factors such as the boll weevil’s devastation of Southern cotton crops and the slowdown of European immigration after World War I.

Despite the importance of this era for understanding how American cities came to be segregated, it has been the focus of very little empirical work in economics. This lack of attention stems from the absence of finely detailed spatial demographic data on cities for time periods prior to 1940. We have recently constructed such a dataset. It covers 10 major cities and was built by digitizing maps of census enumeration districts and matching them to the full-count census data from 1900, 1910, 1920, and 1930. The resulting dataset gives us new opportunities to study urban population dynamics in prewar America.

The Origins of Urban Segregation in the United States

Allison Shertzer and Randall P. Walsh

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The Role of White Flight

Recent scholarship in law and history argues that the federal government played a key role in segregating American cities, for instance by “redlining” potentially integrated neighborhoods when issuing mortgage insurance policies beginning in the mid-1930s. While these government actions may have been important for maintaining the color line in the postwar era, there exists little empirical support for the notion that government intervention was crucial for the initial establishment of segregated neighborhoods. Given that contemporary urban economics literature highlights how uncoordinated, intra-city household sorting across urban areas can increase segregation by race, it is natural to ask: is it possible that segregation could have arisen even in the absence of discriminatory federal policies?

To answer this question, we use our new neighborhood-level dataset to quantify the extent of “white flight” from neighborhoods receiving black in-migrants. Using methods from the labor economics literature to obtain exogenous variation in where black migrants settled, we argue that white households departed neighborhoods in reaction to black arrivals at an accelerating rate over the 1900–30 period. Using a simple counterfactual model to assign blacks to locations that reflect differing levels of institutional barriers to settling in new neighborhoods, we argue that white flight can explain as much as 50 percent of the observed increase in segregation that occurred over the 1920s, the key prewar decade for the consolidation of the ghettos. Our finding that sorting by whites out of neighborhoods with growing black populations was a quantitatively important phenomenon prior to the postwar opening of the suburbs is novel and calls into question the notion that the federal government was uniquely responsible for segregating America. Our results suggest that, even in the absence of effective barriers to black settlement in white neighborhoods, segregation would likely have arisen as a direct consequence of the widespread and decentralized relocation decisions of white households within an urban area. These results imply that policies that reduce barriers faced by blacks in the housing market—such as those contained in the Fair Housing Act of 1968—may thus not prevent or reverse segregation as long as white households desire to avoid black neighbors or have concerns about the quality of public goods and amenities in neighborhoods experiencing racial turnover.

The above-cited work should not be construed as an argument that government actions have had no effect on the spatial distribution of various racial groups in American cities. For instance, recent work finds that Home Ownership Loan Corporation lending risk maps have had a long-term impact on home ownership rates and credit scores of individuals who live in neighborhoods that were unfavorably rated. Urban governments also have great scope to shape where individuals of different races and incomes live. The impact of city-level policies has received comparatively less attention in the extant economics literature. To this point, we have undertaken several projects with various coauthors to assess the impacts of zoning and public transit infrastructure on the development of segregated cities.

Racial and Land Use Zoning Ordinances

The most direct way that urban governments have attempted to segregate their populations is through the adoption of explicitly racial zoning ordinances. Passed by cities between 1910 and 1917, these ordinances prohibited members of the majority racial group on a given city block from selling or renting property to members of another racial group. Walsh and co-author Werner Troesken’s work suggests that prior to the adoption of these laws cities had created and sustained residential segregation through private norms and vigilante activity. Only when these private arrangements began to break down during the early 1900s did whites begin lobbying municipal governments for the passage of segregation ordinances. While these ordinances are salient indicators of racial attitudes in the early 1900s, continual court challenges reduced their direct impact on segregation. The potential efficacy of segregation ordinances was effectively ended in 1917 by the landmark Buchanan v. Warley decision, in which the United States Supreme Court struck down a racial zoning ordinance adopted by Louisville, Kentucky.

The outlawing of racial zoning ordinances meant that city governments could no longer legally enshrine the unequal treatment of neighborhoods by race. However, the potential misappropriation of purportedly race-blind “comprehensive” land use regulations is another way that zoning could have led to increased residential segregation. These ordinances, which set our allowable uses and building volumes for every block in the city, gained traction shortly after World War I. Today nearly every city in the United States has such an ordinance in force.

In joint work with Tate Twinam, we study the original zoning ordinance adopted by the city of Chicago in 1923, which was quite typical of land use regulation at the time.7 The initial zoning ordinance was preceded in 1922 by a survey of land use at the city-block level. By digitizing this fine-scale geographic data on pre-existing land use we are able to
separate the effect of zoning from persistence in land use in our empirical work. We find that, conditional on preexisting uses, black neighborhoods were targeted for higher-density and industrial use zoning, compared with neighborhoods with white native-born residents. Discrimination in zoning thus survived in policies that were de jure race blind. In related work, we follow land use in Chicago over the 20th century and argue that zoning is far more influential than previously thought in determining the location of economic activity within cities. Land use regulation could thus be a key mechanism through which local governments fostered and maintained segregation by race.

Transportation and Neighborhood Stability

Urban governments also may have facilitated separation between racial groups by investing in public transit infrastructure. The sharp increase in segregation broadly tracks the proliferation of streetcars and, later, the private automobile. As late as the 1920s, however, significant majorities of urban residents were commuting using public transit in major cities. In ongoing work, we are digitizing maps of public transit systems in major cities to investigate their impact on demographic sorting within urban areas.

We hypothesize that public transportation was critical for the acceleration of white flight because streetcars and subways significantly reduced the cost of living further away from employment centers. Household preferences for racial composition could have interacted with municipal infrastructure investments to increase residential segregation. Such a finding would further underscore the lesson that policies that were race-neutral on their face likely contributed to the development of segregated cities.

Our current work also explores the intersection of household preferences and collective action by whites to create neighborhoods populated almost entirely by African Americans, in particular the phenomenon of “blockbusting.” This term was used to describe the process by which ghettos expanded in American cities. Real estate agents would select a promising area, usually adjacent to an existing black neighborhood, acquire a few properties, and rent them to African American families. The ensuing panic amongst the remaining white residents allowed realtors to buy the remaining properties at a discount and divide them into cramped apartments for additional black tenants.

To explore the housing market dynamics associated with blockbusting, we are constructing a unique panel dataset of addresses spanning the 1930s, a decade which saw significant expansions of ghettos in northern cities. Specifically, we are matching addresses from the population censuses of 1930 and 1940, the first national surveys to ask about housing prices. The resulting dataset will allow us to explore the housing price dynamics associated with racial turnover in urban neighborhoods, providing a fuller picture of the welfare implications of blockbusting and increased segregation.

Allison Shertzer is a faculty research fellow in the NBER’s Development of the American Economy Program. An assistant professor of economics at the University of Pittsburgh, she received bachelor’s degrees in industrial engineering and mathematics from Arizona State University in 2006 and a PhD in economics from the University of California, Los Angeles in 2011. She is a member of the boards of editors of Explorations in Economic History and Historical Methods.

Shertzer’s main areas of research are cities and immigration in early 20th century America. Her work on the origins of residential segregation by race has been supported by the National Science Foundation. She has also studied how the arrival of European immigrants shaped the provision of public goods in prewar urban areas.

Shertzer traces her ancestry to mid-18th century German immigrants who settled in Pennsylvania, of which she is a ninth-generation resident. She lives in Pittsburgh with her husband and two young daughters.

Randall Walsh is a research associate in the NBER’s Environment and Energy Economics Program and a professor of economics at the University of Pittsburgh. He received his bachelor’s degree in economics from the University of New Hampshire in 1996 and his PhD from Duke University in 2002. He is a member of the editorial council of the Journal of Environmental Economics and Management.

Walsh’s research focuses on issues arising at the various intersections of race, the environment, cities and politics. This work has been supported by both the National Institutes of Health and the National Science Foundation. Walsh traces his southwestern Pennsylvania roots back to Richard “Big Dickey” Dotson, who prided the region’s woods while serving in the U.S. Army as an “Indian Spy” during the Revolutionary War. He lives in Pittsburgh with his wife and two teenage daughters.
Digital currencies such as bitcoin and the underlying blockchain technology are among the most exciting recent innovations in finance. During 2017, surging interest in cryptocurrencies drove their total market value above $600 billion, an increase of more than 700 percent for the year, and major corporations and governments launched blockchain projects in diverse areas such as shipping and logistics, electric power distribution, and real estate title registration. Blockchain refers to a series of records, typically holding data such as financial transactions, protected by cryptographic tools and arranged sequentially, such that any attempt to change a prior entry throws off all entries after that point in the chain. This property makes blockchain ledgers resistant to tampering and provides much greater security than conventional double-entry bookkeeping.

In a series of papers, I have explored both the potential and the limitations of this emerging technology. Due to the libertarian thrust of the current philosophy inherent in the stateless design of digital currencies, the topic evokes neoclassical ideas from the institutional economics of the 19th and 20th centuries, reviving ideas behind such movements as the Jacksonian era of Free Banking, in which private currencies played a much larger role in the economy than government fiat currencies, and the 1930s Chicago Plan for a narrow banking system with a 100 percent reserve requirement.

This article summarizes my digital currency work in three areas: the suitability of bitcoin as a currency, how blockchain technology may impact central banking, and the potential for blockchain technology to disrupt the equity markets and the dynamics of corporate governance. This work draws upon finance and banking as well as law and economics, cryptography, macroeconomics, and other fields.

### Bitcoin as a Currency

Bitcoin is described by its anonymous creator as "a peer-to-peer electronic cash system," a stateless payment system that does not rely upon a trusted intermediary such as a central bank or a mint. Its money supply is regulated by transparent, open source computer code, and transactions are validated by a system of double-key cryptography and are entered into a decentralized, widely distributed ledger through a periodic competition known as mining. Since the first use of bitcoin to pay for two pizzas in May 2011, a gradually increasing network of merchants has begun accepting bitcoin as payment for goods and services in the real economy.

While its design is indisputably novel and clever, a natural question to investigate is how well bitcoin fulfills the classical roles of money. I began to explore that question in late 2013, when the value of a bitcoin soared above $1,000 during an episode of feverish investor speculation and concluded that bitcoin does not behave much like a currency, according to the criteria widely used by economists.

Instead, bitcoin resembles a speculative investment similar to the internet stocks of the late 1990s. Bitcoin’s volatility is an order of magnitude larger than that of other currencies and much higher than even the volatilities of risky growth stocks, which tend to top out in the range between 0.50 and 1.00. Many bitcoin enthusiasts have argued that its volatility should decline to more normal levels as the currency becomes more widely used, but Figure 2, which displays the volatility measured in a 120-day moving average over the six-year period 2012–17, shows that this has not occurred. Instead, bitcoin’s volatility has gyrated, by late 2017, it had spiked to a level not seen since four years earlier.

As a store of value, bitcoin faces great challenges due to rampant hacking attacks, thefts, and other security-related problems. Bitcoin’s daily exchange rate with the U.S. dollar exhibits virtually zero correlation with the dollar’s exchange rates against other prominent currencies such as the euro, yen, Swiss franc, and British pound, and also against gold. Because bitcoin’s value is almost completely unhedged from that of other assets, it is not a useful tool for risk management.

Bitcoin also lacks additional characteristics usually associated with currencies. It cannot be deposited in a bank, and instead must be possessed through a system of “digital wallets” that have proved both costly to maintain and vulnerable to predators. No form of insurance has been developed for owners of bitcoin comparable to the deposit insurance relied on by bank customers in most economies. No lenders use bitcoin as the unit of account for standard consumer finance credit, home loans, or personal mortgages, and to date no credit or debit cards have been denominated in bitcoin. Bitcoin cannot be sold short, and financial derivatives such as forward contracts and swaps that are routine for other currencies have not existed for bitcoin until very recently, when the major Chicago commodities exchanges began listing bitcoin futures in December 2017. A major price decline began very shortly after the inception of futures trading, permitting speculators to bet for the first time against its further appreciation.

However, concluding that bitcoin does not meet standard criteria as a form of money implicitly raises the question of whether we have the right definition of money. An interesting alternative—“money is memory”—has been proposed in a provocative paper by Narayana R. Kocherlakota. This work, which predates the launch of bitcoin by more than a decade, follows a logic quite similar to the blockchain distributed ledger that underlies bitcoin and other digital currencies.

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**Figure 1**

Money is typically defined by economists as having three attributes: It serves as a medium of exchange, a unit of account, and a store of value. Bitcoin somewhat meets the first of these criteria, because a growing number of merchants, especially in online markets, appear willing to accept it as a form of payment. However, the worldwide commercial use of bitcoin remains minimal, indicating that few people use it widely as a medium of exchange, and those who do can be encumbered by security precautions and long delays needed to verify transactions.

Bitcoin also performs poorly as a unit of account, because merchants must quote the prices of common retail goods out to five or six decimal places with leading zeros, a practice rarely seen in consumer marketing and that is likely to drive away price-sensitive buyers. In addition, bitcoin exhibits very high time series volatility, and it trades for different prices on different exchanges without the possibility of arbitrage. These characteristics undermine bitcoin’s usefulness as a unit of account. Figure 1 shows the volatility of the daily bitcoin-U.S. dollar exchange rate in 2013, compared with that of other major currencies and gold. Bitcoin’s volatility is an order of magnitude larger than that of other currencies and much higher than even the volatilities of risky growth stocks, which tend to top out in the range between 0.50 and 1.00. Many bitcoin enthusiasts have argued that its volatility should decline to more normal levels as the currency becomes more widely used, but Figure 2, which displays the volatility measured in a 120-day moving average over the six-year period 2012-17, shows that this has not occurred. Instead, bitcoin’s volatility has gyrated, by late 2017, it had spiked to a level not seen since four years earlier. As a store of value, bitcoin faces great challenges due to rampant hacking attacks, thefts, and other security-related problems. Bitcoin’s daily exchange rate with the U.S. dollar exhibits virtually zero correlation with the dollar’s exchange rates against other prominent currencies such as the euro, yen, Swiss franc, and British pound, and also against gold. Because bitcoin’s value is almost completely unhedged from that of other assets, it is not a useful tool for risk management. Bitcoin also lacks additional characteristics usually associated with currencies. It cannot be deposited in a bank, and instead must be possessed through a system of “digital wallets” that have proved both costly to maintain and vulnerable to predators. No form of insurance has been developed for owners of bitcoin comparable to the deposit insurance relied on by bank customers in most economies. No lenders use bitcoin as the unit of account for standard consumer finance credit, home loans, or personal mortgages, and to date no credit or debit cards have been denominated in bitcoin. Bitcoin cannot be sold short, and financial derivatives such as forward contracts and swaps that are routine for other currencies have not existed for bitcoin until very recently, when the major Chicago commodities exchanges began listing bitcoin futures in December 2017. A major price decline began very shortly after the inception of futures trading, permitting speculators to bet for the first time against its further appreciation. However, concluding that bitcoin does not meet standard criteria as a form of money implicitly raises the question of whether we have the right definition of money. An interesting alternative—“money is memory”—has been proposed in a provocative paper by Narayana R. Kocherlakota. This work, which predates the launch of bitcoin by more than a decade, follows a logic quite similar to the blockchain distributed ledger that underlies bitcoin and other digital currencies.
Central Bank Digital Currency

Although bitcoin and other digital currencies were created to bypass the control of central banks, the possibility of a central bank withdrawing its bills and notes from circulation and replacing them with its own blockchain-based digital currency has become an appealing topic of debate among monetary economists, and many central banks are openly investigating this possibility. Max Raskin and I review the most widely circulated proposals of this type and evaluate their potential costs and benefits.

Most central bank digital currency proposals are a variant of the “Fedcoin” scheme advanced by a commentator in 2014. The Fedcoin ideas have been taken up and discussed in policy papers by top officials of the Bank of England, among others. Under the Fedcoin proposal, citizens and businesses would be permitted to open accounts at the central bank itself, rather than depositing their funds in commercial banks as is done today. Central bank digital accounts could initially be funded by permitting depositors to convert existing currency, presumably at a one-to-one rate, and the new digital currency would reside on a blockchain operated by the central bank. When depositors wished to spend their digital currency, they would convey it over the central bank to the account of another party. By concentrating deposits in the central bank, Fedcoin schemes would implicitly end the practice of fractional reserve banking, “narrowing” the banking system so that depositors dealt directly with the central bank rather than with intermediary private banks.

In many ways, Fedcoin represents a clearing system so that depositors dealt with the central bank itself, rather than with intermediary private banks.

The implications of these innovations could be vast. The central bank would no longer be vulnerable to runs, and governments could stop providing deposit insurance and occasional bailouts as the lender of last resort to inadequately funded commercial banks. Commercial banks would no longer have to engage in “maturity transformation,” under which they raise funds from short-term demand deposits and lend them out in long-term mortgages and other loans, and they would presumably recapitalize themselves with long-term debt and equity securities. Risk-shifting and other moral hazard problems on the part of banks, which now receive free deposit insurance from the government, might be eliminated.

In macroeconomics, the main advantages to a central bank of having its own digital currency would come from giving the government more control and understanding of the financial system. Such control could facilitate policy intervention in response to the business cycle while also ensuring better individual compliance with tax collection and anti-money laundering statutes.

Blockchains and Corporate Finance

Blockchains appear to have great potential in corporate finance. In addition to virtual currencies, blockchains can also hold debt securities and financial derivatives, which can be executed autonomously as “smart contracts” — computer code written to execute the reciprocal promises of two parties when agreed upon contingencies are met. Companies could issue shares on a blockchain in several forms. A firm could operate and update its own private blockchain and sell shares directly to investors, who could then trade them on the same platform. A firm could also create a decentralized public blockchain similar to bitcoin’s, in which shares were issued as rewards to miners for doing the work of updating the ledger. A third alternative would be to use an existing blockchain and attach shares of stock to coin transactions, using the so-called “colored coins” approach, which refers to bitcoin transactions that include a data field conveying information about other assets, such as the CUSIP number of a Treasury bond, that a seller wishes to transfer to a buyer. Finally, an existing stock exchange might improve its operations by adopting blockchain technology for post-trade clearing and settlement, as the Sydney-based ASX exchange is slated to do this year.

Using blockchains to record stock ownership could solve many long-standing problems related to companies’ inability to keep accurate and timely records of who owns their shares. Perhaps most importantly, blockchains could provide unprecedented transparency to allow investors to identify the ownership positions of debt and equity investors, including the firm’s managers, and moreover, corruption on the part of regulators, exchanges, and listed companies. If a firm elected to keep its financial records on a blockchain, opportunities for earnings management and other accounting gimmicks could drop dramatically, and related party transactions would become more transparent.

The greater transparency of ownership associated with recording stock ownership on blockchains could provide firms with an early warning system when activists or raiders begin to buy shares. This would effectively make blockchains into a type of takeover defense, by undercutting the element of surprise and raising the cost for active investors to acquire shares.

On blockchains such as Ethereum that have more advanced capabilities than bitcoin’s, self-executing smart contracts could replicate contingent claims such as stock options held by employees or warrants owned by outside investors. These smart contracts could extend into areas such as the pre-contracted resolution of financial distress. Further applications appear promising in areas such as shareholder voting, where a number of national stock exchanges already have conducted successful pilot projects.

5 J.P. Koning, “Fedcoin,” jpkoning.blogspot.com/2014/10/fedcoin.html Return to Text
8 21(1), March 2017, pp. 7–34. Return to Text
11 J.P. Koning, “Fedcoin,” jpkoning.blogspot.com/2014/10/fedcoin.html Return to Text
15 J.P. Koning, “Fedcoin,” jpkoning.blogspot.com/2014/10/fedcoin.html Return to Text
Measuring the Motives for Charitable Giving
Jonathan Meer and Harvey S. Rosen

Charitable giving plays an important role in the U.S. economy. In 2016, individuals gave $282 billion to churches, museums, universities, and myriad other institutions.1 A variety of issues pertaining to charitable behavior have been covered in the economics literature. Two of the more important ones have arisen in discussions of the motivations for giving. The first is reciprocity—people donating something in return. The second is altruism: what factors influence whether an individual develops a feeling of a community of interest with a charitable institution?

In a series of papers, we have examined these issues through the lens of alumni donations to universities. The determinants of alumni donations are of independent interest because of their importance in university budgets—donations were about $41 billion in 2016 and covered roughly one-third of the annual budget because of the importance of university-alumni relationships. The University of Michigan and received its PhD from Harvard University. He has been a member of Princeton’s Department of Economics since 1974, serving as department chair from 1993 to 1996 and as codirector of the Center for Economic Policy Studies from 1993 to 2011. He was the inaugural master of Whitman College, Princeton’s sixth undergraduate residential college. Rosen has been involved in both the graduate and undergraduate teaching programs at Princeton. In recent years, he has taught courses in public finance, taxation, and introductory and intermediate microeconomics. From 1989 to 1991 he served in the U.S. Department of the Treasury as deputy assistant secretary for tax analysis. During a second stint in Washington, from 2003 to 2005, he served on the President’s Council of Economic Advisers, first as a member and then as chair, providing advice to the White House on tax reform, Social Security, health care, energy, the federal budget, and financial market regulation.

Rosen’s main field of research is public finance, a topic on which he has published several dozen articles in scholarly journals and an undergraduate textbook. He was elected a Fellow of the Econometric Society in 2006, a Past President of the American Economic Association, and was named a Scholar of the Econometric Society in 2006, and in 2007 received the National Tax Association’s Daniel M. Holland Medal, for distinguished lifetime contributions to the study and practice of public finance.

1. No. 1, March 2018

2. Harv. S. Warner Award for Outstanding Research in Alumni Relations for Educational Advancement in 2009 and 2012. He was cofounder of an online Principles of Microeconomics course at Texas AM that reaches 3,000 students per year.

3. Meer received his bachelor’s degree in economics from Princeton University in 2002 and his PhD in economics from Stanford University in 2009. He won the CASE H.S. Warwick Award for Outstanding Research in Alumni Relations for Educational Advancement in 2009 and 2012. He was codirector of an online Principles of Microeconomics course at Texas AM that reaches 3,000 students per year.

4. Harvey S. Rosen is the John L. Weinberg Professor of Economics and Business Policy at Princeton University. He was an undergraduate at the University of Michigan and received his PhD from Harvard University. He has been a member of Princeton’s Department of Economics since 1974, serving as department chair from 1993 to 1996 and as codirector of the Center for Economic Policy Studies from 1993 to 2011. He was the inaugural master of Whitman College, Princeton’s sixth undergraduate residential college. Rosen has been involved in both the graduate and undergraduate teaching programs at Princeton. In recent years, he has taught courses in public finance, taxation, and introductory and intermediate microeconomics. From 1989 to 1991 he served in the U.S. Department of the Treasury as deputy assistant secretary for tax analysis. During a second stint in Washington, from 2003 to 2005, he served on the President’s Council of Economic Advisers, first as a member and then as chair, providing advice to the White House on tax reform, Social Security, health care, energy, the federal budget, and financial market regulation.

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5. Jonathan Meer is an associate professor of economics at Texas AM University. He is a research associate in the NBER’s Education Economics Programs and a professor at Texas AM’s Private Enterprise Research Center.

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7. The Anon U data allowed us to make a rough estimate of the extent to which donations were due to a particular kind of reciprocity, namely, the hope that donations will help their children gain acceptance to the university. Although Anon U makes no promise whatever that donations will increase the likelihood of acceptance, this view that they could is widespread.

8. See the chapter by Rosen. The Anon U data provided us with detailed explanations of their solicitation practices.

9. Economists have long recognized that people are not entirely selfish; altruism is an important part of human behavior. That said, some charitable behavior is doubtless driven in part by self-interest. In particular, donors might expect something in return for their gift, such as prestige, tangible benefits like gifts or access to social events, and the ability to signal their virtue to others.

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time, though, the amount donated does increase with the size of the scholarship, suggesting that reciprocity plays a role.

The large role played by athletics at The University of Texas at Austin in the solicitation activities turn out to provide a useful framework for addressing this concern. Solicitors, as a group, are highly motivated, through letters and emails, until June, even long after they have completed their studies, but show that it is driven primarily by approaching mortality. That is, the social component behind this empirical regularity. To do so, we supplement our data with information extracted from obituaries published in the alumni magazine. On the other hand, while alumni whose children, nieces, or nephews attended Anon U donate more than alumni who do not have a member of the younger generation attended. On the other hand, while alumni whose parents, aunts, or uncles attended Anon U donate substantially more than alumni who do not have a member of the younger generation attended. On the other hand, while alumni whose parents, aunts, or uncles attended Anon U donate more than alumni without relatives who did not attend Anon U, the effect is smaller. And having a grandparent who attended Anon U does little to change giving. 

Universities can form stronger bonds with individuals earlier in life, by raising their degree of loyalty, leading to the financing of endowment, bequests will likely primarily by approaching mortality. We estimate the relationship between engaging in fundraising and volunteering at age 18 or younger and giving and volunteering as an adult. Closing the gap of family factors that could induce an individual to exhibit altruistic behavior by a conference championship could have a transitory effect on the frequency of giving behavior. suggesting that former athletes at such institutions fail to develop an affinity for their own teams — the results on the importance of one’s own-team championships could have a transitory effect on the frequency of giving behavior. We examine the giving patterns induced by these external inducements to determine whether the impact of donative behavior when young on giving when older. 

The large role played by athletics at the University of Texas at Austin, in several papers we have investigated the factors that engender affinities between a university and its alumni. At Anon U, a former student who attended Anon U, it is driven by family factors that could induce an individual to exhibit altruistic behavior by a conference championship could have a transitory effect on the frequency of giving behavior. suggesting that former athletes at such institutions fail to develop an affinity for their own teams — the results on the importance of one’s own-team championships could have a transitory effect on the frequency of giving behavior. We examine the giving patterns induced by these external inducements to determine whether the impact of donative behavior when young on giving when older. 

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Concerns about rising inequality inform important debates on some of our most significant issues, including income tax design, immigration, and globalization. The debate over inequality relies almost exclusively on income data that indicate that inequality has increased sharply in recent decades. Yet economists generally prefer using consumption rather than income to measure well-being. For this reason, and because consumption is better reported than income for some segments of the population, I have reexamined inequality patterns using consumption data. In several papers, mostly with James Sullivan of the University of Notre Dame, I find that income data paint an incomplete and at times distorted view of how inequality in economic well-being has changed in the United States. Because public and private transfers, and in some cases the drawdown of prior savings, raise consumption relative to income for the lowest income groups, consumption patterns indicate a much more modest increase in inequality than the income data suggest.

Why Consumption?

Although income is the most commonly used measure of the economic well-being of U.S. households, there are a number of reasons why measuring how much people spend on food, shelter, transportation, and other goods and services provides a more accurate picture of their circumstances. Income typically fluctuates more than economic well-being, because people can save when income is temporarily high and borrow when it is temporarily low. Income also fails to reflect the flow of services received if one already owns a house or a car, and has no expenditures but significant consumption. A retired couple in their own home living off the savings accumulated over a lifetime may be living quite comfortably even if they have no income.

Consumption measures will reflect the loss of housing-services flows if homeownership falls, the loss in wealth if asset values fall, and the belt-tightening that a growing debt burden might require — all of which an income measure would miss. Furthermore, consumption is more likely than income to be affected by access to public insurance programs, and to capture the effects of changes in access to credit or the government safety net.

Consumption is better than income at reflecting deprivation. In a series of papers, Sullivan and I show that measures of material hardship or adverse family outcomes are more severe for those with low consumption than for those with low income.

Several researchers have documented the patterns in consumption inequality. The evidence from this literature is mixed. Some studies show little change in consumption inequality over the past few decades and others show a proportional rise equal to or exceeding that of income. These differences arise from the use of different data sources or definitions of consumption — for example, total consumption or nondurable consumption — and different methods of addressing measurement error.

Addressing Concerns about Data Quality

While consumption has a number of conceptual advantages relative to income as a measure of well-being, and has no expenditures but significant consumption. A retired couple in their own home living off the savings accumulated over a lifetime may be living quite comfortably even if they have no income.

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Addressing Concerns about Data Quality

While consumption has a number of conceptual advantages relative to income as a measure of well-being,
previous studies have raised concerns about the quality of both income and consumption data. There is considerable evidence that income is substantially underreported in national surveys, especially in categories of income important for those with low resources, and that the extent of underreporting has increased over time. For example, only about half of all dollars transferred through the Temporary Assistance for Needy Families (TANF) program, food stamps (the Supplemental Nutrition Assistance Program, SNAP), and pensions have been captured in the principal income surveys in recent years. At least some components of consumption are also underreported in surveys. However, recent research has shown that among the eight largest categories of expenditures, six are reported at a high rate in the Consumer Expenditure Interview Survey, the best source of data on household spending, and that rate has been roughly constant over time. These comparisons also indicate that spending collected through a recall survey compares more favorably to national aggregates than does spending collected via a diary survey that appears too burdensome to complete accurately.

One way to address concerns about the quality of consumption data is to focus on components of consumption that are well-measured, including food at home, rent plus utilities, gasoline and motor oil, the rental value of owner-occupied housing, and the rental value of owned vehicles. In order to draw conclusions about components of consumption inequality from evidence on the well-measured components, it is critical that these components be equally important for high- and low-consumption households. It is also important that price changes for well-measured consumption mirror the price changes for overall spending. Both of these conditions appear to hold: well-measured consumption is roughly a constant share of overall consumption throughout the distribution, and the price of the bundle of well-measured goods has not changed noticeably relative to the prices for all goods.

### Trends in Income and Consumption Inequality

Official measures of income inequality suggest a steady rise in the U.S. since the early 1970s. An important limitation of the official statistics is that they are based on pre-tax money income, which does not account for tax credits and in-kind transfers, such as housing benefits and food stamps, which have increased sharply over time. Income inequality still rises for measures of income that more closely reflect family resources available for consumption, but the rise is less noticeable. Using our improved measure of consumption, however, a very different story emerges. These differences are evident in Figure 1, where we report the ratio of the 99th percentile to the 10th percentile (the 90/10 ratio) for pre-tax money income, after-tax money income, and well-measured consumption. Since the

The center and right panels of Figure 1 show that income inequality has risen for the top (90/50 ratios) and bottom (50/10 ratios) of the distribution, but increases in consumption inequality are only evident for the top. The finding that the consumption dispersion and income inequality at the top are fairly similar from the early 1960s through 2005 suggests that underreporting of consumption by the wealthiest is relatively small and the differences in inequality over time.

Our evidence of only a modest rise in consumption inequality over the past five decades contrasts sharply with evidence from tax data that an increasing share of the nation’s income is going to the very highest income families, though several papers using broader and more consistent measures of income reported on income tax forms do not show large increases in the top 1 percent’s income share. Our analyses are distinct from these studies that focus on the highest income households. We do not include the extreme tails of the distribution because resources are likely to be poorly measured in survey data for these observations. Tax returns alone are also unsuitable for measuring incomes at the bottom, since they miss non-filers and important sources of income such as TANF, SSI, SNAP and housing benefits, which are not taxable.

What Explains the Sharp Differences in Inequality Patterns?

Many factors likely contribute to the differences between income and consumption inequality. As discussed above, there is considerable evidence that income sources that are particularly important for those at low income are not as well measured by income tax returns as the distribution is significantly underreported in surveys and that the extent of under-reporting has grown over time. A story of declining average incomes at the bottom of the distribution is supported by evidence that between 2006 and 2010, a period of sharply falling asset prices, consumption spending rose for the lowest asset quintile, ranked by asset holdings, while it fell for the top four quintiles.

### Implications

Most of the discussion around recent trends in inequality highlights growing dispersion. However, the evidence from consumption data indicates that changes in inequality in consumption are much more nuanced than a simple story of rising income dispersion would suggest. In the bottom half of the distribution there is little evidence of rising consumption inequality and, in the top half of the distribution the rise in consumption inequality has been much more modest than the rise in income inequality, particularly since 2000.

### Return to Text

6. See Figure 1 in B. Meyer and J. Sullivan, “Consumption and Income Inequality in the U.S. Since the 1960s,” NBER Working Paper No. 23655, August 2017. Return to Text
8. Adding non-cash benefits (such as the value of food stamps and housing and school lunch subsidies as calculated by the Census Bureau) leads to slightly lower inequality, but the changes over time are similar to those for after-tax money income. Return to Text
9. See B. Meyer and J. Sullivan, “Consumption and Income Inequality in the U.S. Since the 1960s,” NBER Working Paper No. 23655, August 2017, for more details. The statistics are based on the authors’ calculations. All income data are from the Current Population Survey and all consumption data are from the Consumer Expenditure Interview Survey. Return to Text

NBER News

Awards

Susan Athey was elected a vice president of the American Economic Association. Jonathan Berk and the late Richard Green were awarded the Stephen Ross Prize, a biannual award from the Foundation for the Advancement of Research in Financial Economics for a paper in financial economics published in the last 15 years, for “Mutual Fund Flows and Performance in Rational Markets.”

John Beshears, James Choi, David Laibson, and Brigitte Madrian received the TIAA Paul A. Samuelson Award for Outstanding Scholarly Writing on Lifelong Financial Security, for their paper, “Does Aggregated Returns Disclosure Increase Portfolio Risk-Taking?”

Francine D. Blau was awarded the 2017 Jacob Mincer Award by the Society of Labor Economists in recognition of lifetime contributions to the field of labor economics. Anne C. Case was elected to the American Academy of Arts and Sciences, the American Philosophical Society, and the National Academy of Medicine. She and Angus Deaton received the Franklin Fellow Award, recognizing excellence in a field germane to the interests of Benjamin Franklin.

Wesley Cohen received the Wiley Technology Innovation Management Distinguished Scholar Award, a lifetime achievement award conferred by the Technology Innovation Management Division of the Academy of Management. Janet Currie received an honorary doctorate from the University of Zurich. Stefano DellaVigna and Brian Knight, and their coauthors Ruben Durante and Eliana La Ferrara, received the American Economic Journal: Applied Economics Best Paper Prize for their paper, “Market-Based Lobbying: Evidence from Advertising Spending in Italy.”

Dave Donaldson received the John Bates Clark Medal from the American Economic Association and was elected a Fellow of the Econometric Society.

Darrell Duffie and Haosong Zhu and their coauthor Piotr Dowczak won a 2017 Amundi Pioneer Prize from the American Finance Association, awarded annually for the top three papers in fields other than corporate finance, for their paper, “Benchmarks in Search Markets.”

Mara Faccio was elected a director of the American Finance Association.

Pinelopi Goldberg was elected a vice president of the American Economic Association.

Claudia Goldin received an honorary doctorate from the European University Institute.

Gautam Gowrisankaran was awarded an honorary doctorate from the University of Oulu in Finland.

John Graham was awarded the American Taxation Association Outstanding Manuscript Award for “Tax Rates and Corporate Decision-Making,” a joint paper with Michelle Hanlon and Terry Shevlin. He, Campbell R. Harvey, and their coauthors Ilia Dichev and Shiva Rajgopal also received a Graham and Dodd Scroll for their paper, “The Misrepresentation of Earnings.”

Gene M. Grossman presented the Ohlin Lectures at the Stockholm School of Economics.

Rucker Johnson received an Andrew Carnegie fellowship.

Valerie Ramey was elected to the American Academy of Arts and Sciences.

Janet Currie received a 2017 EMET Prize in Economics, an award for excellence in academic and professional achievements that is sponsored by the A.M.N. Foundation for the Advancement of Science, Art, and Culture in Israel, under the auspices of and in cooperation with the Prime Minister of Israel.

Stephen J. Redding won the 2017 Jacob Mincer Award by the Society of Labor Economists in recognition of lifetime contributions to the field of labor economics.
Antoinette Schoar, Amir Sufi Codirecting Corporate Finance Program

Antoinette Schoar, the Michael M. Koerner (1949) Professor of Entrepreneurial Finance at the MIT Sloan School of Management, and Amir Sufi, the Bruce Lindsay Professor of Economics and Public Policy at the University of Chicago Booth School of Business, are the new codirectors of the NBER’s Program on Corporate Finance.

Schoar’s research interests span household finance and consumer behavior, the financing of start-ups and entrepreneurial firms, and the role of financial markets in emerging market economies. She is a recipient of the Kaufman Medal for Distinguished Research in Entrepreneurship. Between 2009 and the start of her new program director duties, she was the director of the NBER’s Entrepreneurship Working Group.

Schoar was also an associate editor of The Journal of Finance and the Journal of Economic Perspectives, and a co-founder of ideas42, a non-profit organization that uses insights from behavioral economics and psychology to solve social problems. She received her PhD in economics from the University of Chicago and her undergraduate degree from the University of Cologne, in Germany. She has been an NBER affiliate since 2001.

Sufi’s research focuses on finance and macroeconomics, with a particular emphasis on links between credit markets and the real economy. He was awarded the 2017 Fischer Black Prize, given biannually to the top financial economists under the age of 40 by the American Finance Association. He has taught at Chicago Booth since 2005.

An undergraduate at Georgetown, Sufi earned his PhD in economics from MIT, where he was awarded the Robert M. Solow Endowment Prize for Graduate Student Excellence in Teaching and Research. He serves as an associate editor for the American Economic Review, The Journal of Finance, and the Quarterly Journal of Economics. Sufi became an NBER affiliate in 2009 and is also an affiliate of the Economic Fluctuations and Growth and Monetary Economics Programs.

David Robinson Becomes Director of Entrepreneurship Working Group

David Robinson, the new director of the Entrepreneurship Working Group, is the J. Rex Fuqua Distinguished Professor of International Productivity and Management and a professor of finance at Duke University’s Fuqua School of Business. His research focuses on entrepreneurial corporate finance and household finance, in particular the economics of the private equity industry and the role of financial literacy in household decision-making.

Robinson received his undergraduate degree from the University of North Carolina at Chapel Hill and his PhD from the University of Chicago. He has been an NBER member since 2010, with affiliations in both the Corporate Finance and Productivity, Innovation, and Entrepreneurship Programs.

Robinson has served as the coordinator of the Entrepreneurship Research Boot Camp, a component of the NBER Summer Institute that brings together promising graduate students interested in economic research on entrepreneurship. He is also a visiting professor at the Swedish House of Finance in Stockholm, and an associate editor of The Journal of Finance.
Conferences

Economics of Digitization

A conference on “Economics of Digitization” took place at Stanford University on March 1–2. Research Associates Shane Greenstein and Josh Lerner of Harvard University and Scott Stern of MIT organized the meeting, which was sponsored by the Alfred P. Sloan Foundation. These researchers’ papers were presented and discussed:

- Ananya Sen, MIT, and Catherine Tucker, MIT and NBER, “Information Shocks and Internet Silos: Evidence from Creationist-Friendly Curriculum”
- Elizabeth Lyons, University of California, San Diego, and Laurina Zhang, Georgia Institute of Technology, “Research as Leisure: Experimental Evidence on Voluntary Contributions to Science”
- Daniel Bjorkegren, Brown University, and Darrell Grissen, “Behavior Revealed in Mobile Phone Usage Predicts Loan Repayment”
- Neil Thompson, MIT, and Douglas Hanley, University of Pittsburgh, “Science is Shaped by Wikipedia: Evidence from a Randomized Control Trial”
- Christian W. Peukert, Catholic University of Portugal, and Imke C. Reimers, Northeastern University, “Digital Disintermediation and the Market for Ideas”
- Brett W. Hollenbeck, University of California, Los Angeles: Davide Proserpio, University of Southern California; and Sridhar Moorthy, University of Toronto, “Advertising Strategy in the Presence of Reviews: An Empirical Analysis”
- Chiara Faronato, Harvard University and NBER, and Georgios Zervas, Boston University, “Consumer Reviews and Regulation: Evidence from NYC Restaurants”
- Ariel Dora Stern, Harvard University, and Cirrus Foroughi, NBER Research Assistant, “Digital Innovation in a Regulated Industry: Evidence from Software-Driven Medical Devices”
- Megan MacGarvie, Boston University and NBER; Jeremy Watson, Boston University; and John McKeon, Edgeworth Economics, “It was Fifty Years Ago Today: Recording Copyright Term and the Supply of Music”

Summaries of these papers are at: www.nber.org/confer/2018/EIs18/summary.html

Economics of Infrastructure

A conference on “Economics of Infrastructure” took place in Cambridge on March 2. Research Associates James M. Poterba of MIT and Edward L. Glaeser of Harvard University organized the meeting, which was supported by the Alfred P. Sloan Foundation. These researchers’ papers were presented and discussed:

- Treb Allen, Dartmouth College and NBER, and Costas Arkolakis, Yale University and NBER, “The Welfare Effects of Transportation Infrastructure Improvements”
- Marquise McGraw, Consumer Financial Protection Bureau, “Airline Hub Airports and Local Economic Outcomes”
- Ananya Sen, MIT, and Catherine Tucker, MIT and NBER, “Information Shocks and Internet Silos: Evidence from Creationist-Friendly Curriculum”
- Elizabeth Lyons, University of California, San Diego, and Laurina Zhang, Georgia Institute of Technology, “Research as Leisure: Experimental Evidence on Voluntary Contributions to Science”
- Daniel Bjorkegren, Brown University, and Darrell Grissen, “Behavior Revealed in Mobile Phone Usage Predicts Loan Repayment”
- Neil Thompson, MIT, and Douglas Hanley, University of Pittsburgh, “Science is Shaped by Wikipedia: Evidence from a Randomized Control Trial”
- Christian W. Peukert, Catholic University of Portugal, and Imke C. Reimers, Northeastern University, “Digital Disintermediation and the Market for Ideas”
- Brett W. Hollenbeck, University of California, Los Angeles: Davide Proserpio, University of Southern California; and Sridhar Moorthy, University of Toronto, “Advertising Strategy in the Presence of Reviews: An Empirical Analysis”
- Chiara Faronato, Harvard University and NBER, and Georgios Zervas, Boston University, “Consumer Reviews and Regulation: Evidence from NYC Restaurants”
- Ariel Dora Stern, Harvard University, and Cirrus Foroughi, NBER Research Assistant, “Digital Innovation in a Regulated Industry: Evidence from Software-Driven Medical Devices”
- Megan MacGarvie, Boston University and NBER; Jeremy Watson, Boston University; and John McKeon, Edgeworth Economics, “It was Fifty Years Ago Today: Recording Copyright Term and the Supply of Music”

Summaries of these papers are at: www.nber.org/confer/2018/EIs18/summary.html

Economics of Energy Distribution

A conference on “Economics of Energy Distribution” took place in Cambridge on March 7–8. Research Associates James B. Bushnell of the University of California, Davis, Ryan Kellogg of the University of Chicago, and Erin T. Mansur of Dartmouth College organized the meeting, which was sponsored by the Alfred P. Sloan Foundation. These researchers’ papers were presented and discussed:

- Nicholas Ryan, Yale University and NBER, and Anant Sudarshan, University of Chicago, “The Efficiency of Rationing: Agricultural Power Subsidies, Power Supply, and Groundwater Depletion in Rajasthan”
- Justin Kirkpatrick and Steven E. Sexton, Duke University; Bobby Harris, and Nicholas Muller, Carnegie Mellon University and NBER, “Siting Solar PV Capacity to Maximize Environmental Benefits”
- Severin Borenstein, University of California, Berkeley and NBER, and James B. Bushnell, “Are Residential Electricity Prices Too High or Too Low? Or Both?”

Summaries of these papers are at: www.nber.org/confer/2018/EEDs18/summary.html
The Challenges of Globalization in the Measurement of National Accounts

A meeting of the Conference on Research in Income and Wealth, on the topic of "The Challenges of Globalization in the Measurement of National Accounts," took place in Washington on March 9–10. Nadim Ahmad and Peter van de Ven of the OECD, Brent Moulton of the Bureau of Economic Analysis, and Research Associate J. David Richardson of Syracuse University organized the meeting. The program was divided into five parts. These researchers' papers were presented and discussed:

Challenges of Globalization in National Accounts

- Moulton and van de Ven, "Addressing the Challenges of Globalization in National Accounts"
- Silke Stapel-Weber, Paul Konijn, John Verrinder, and Henk Nijmeijer, Eurostat, "Meaningful Information for Domestic Economies in the Light of Globalization — Will Additional Macroeconomic Indicators and Different Presentations Shed Light?"
- Maria Borga and Cecilia Caliandro, OECD, "Eliminating the Pass-Through: Towards FDI Statistics that Better Capture the Financial and Economic Linkages between Countries"
- Fariha Kamal, Bureau of the Census, "A Portrait of U.S. Factoryless Goods Producers"

Accounting for Global Production Processes

- James J. Ferrier, Tina Highfill, Kassu Hossio, Thomas Howells, Erich Strassner, and Jeffrey Young, Bureau of Economic Analysis, "Accounting for Firm Heterogeneity within U.S. Industries: Extended Supply-Use Tables and Trade in Value Added using Enterprise and Establishment Level Data"
- Bart Los and Marcel Timmer, University of Groningen, "Measuring Bilateral Exports of Value Added: A Unified Framework"
- Bernhard Michel, Caroline Hambaye, and Bart Herveldt, Belgian Federal Planning Bureau, "The Role of Exporters and Domestic Producers in GVCs: Evidence for Belgium on Extended National Supply-and-Use Tables Integrated into a Global Multiregional Input-Output Table"
- Nadim Ahmad, "Accounting for Globalization: Frameworks for Integrated International Economic Accounts"

Impact of Transfer Pricing and Tax Avoidance

- Mark Vancanterraen, Hasselt University, and Michael Polder and Marcel van den Berg, Statistics Netherlands, "The Relationship Between Tax Payments and MNEs' Patenting Activities and Implications for Real Economic Activity: Evidence from the Netherlands"
- Derrick Jenniges, Raymond Mataloni Jr., Sarah Stutzman, and Yiran Xin, Bureau of Economic Analysis, "Strategic Movement of Intellectual Property within Multinational Enterprises"
- Jennifer Bruner and Dylan Rassier, Bureau of Economic Analysis; and Kim J. Ruhl, Pennsylvania State University, "Multinational Profit Shifting and Measures through Economic Accounts"

Accounting for the Impact of Globalization in Europe

- John D. FitzGerald, Trinity College Dublin, "National Accounts for a Global Economy: The Case of Ireland"
- Sebnem Kahleli-Ozcan, University of Maryland and NBER; Bent Sorensen, University of Houston; Carolina Villegas-Sanchez, ESADE Business School; and Vadym Volosyovych, Erasmus University Rotterdam, "Who Owns Europe’s Firms? Foreign Investment in Europe and Implications for Risk Sharing"

Globalization and Innovation/Productivity

- Mark de Haan and Joseph Haynes, Statistics Netherlands, "R&D Capitalization: Where Did We Go Wrong?"
- Fernando Galindo-Rueda and Daniel Ker, OECD, and Francisco Moris and John Jankowski, National Science Foundation, "Capturing International R&D Trade and Financing Flows: What Do Available Sources Reveal about the Structure of Knowledge-Based Global Production?"

Summaries of these papers are at: www.nber.org/confer/2018/CRFw18/summary.html

Firms, Networks, and Trade

A conference on "Firms, Networks, and Trade" took place in Cambridge on March 15. Research Associates Laura Alfaro and Pol Antràs, both of Harvard University, and International Trade and Investment Program Director Stephen J. Redding of Princeton University organized the meeting. These researchers' papers were presented and discussed:

- Johannes Boehm, Sciences Po, Paris, and Ezra Oberfield, Princeton University and NBER, "Misallocation in the Market for Inputs: Enforcement and the Organization of Production"
- Yimei Zou, Universitat Pompeu Fabra, Barcelona, "Endogenous Production Networks and Gains from Trade"
- Ernest Liu, Princeton University, "Industrial Policies in Production Networks"
- Ayumu Ken Kikkawa, University of Chicago; Glenn Mageean, Université Libre de Bruxelles; and Emmanuel Dhynne, National Bank of Belgium, "Imperfect Competition and the Transmission of Shocks: The Network Matters"
- Jonathan Eaton, Pennsylvania State University and NBER; Samuel S. Kortum, Yale University and NBER; and Francis Kramarz, CREST-INSEE, Paris, "Firm-to-Firm Trade: Imports, Exports, and the Labor Market"

Summaries of these papers are at: www.nber.org/confer/2018/FNs18/summary.html
Program and Working Group Meetings

Industrial Organization

Members of the NBER’s Industrial Organization Program met at the Stanford Institute for Economic Policy Research on February 9–10. Faculty Research Fellow Myrto Kalouptsidi of Harvard University and Research Associate Jesse M. Shapiro of Brown University organized the meeting. These researchers’ papers were presented and discussed:

- John Asker, University of California, Los Angeles and NBER; Allan Collard-Wexler, Duke University and NBER; and Jan De Loecker, Princeton University and NBER, “Market Power, Production (Mis)Allocation, and OPEC,” (NBER Working Paper No. 23801)
- Stefano DellaVigna, University of California, Berkeley and NBER, and Matthew Gentzkow, Stanford University and NBER, “Uniform Pricing in U.S. Retail Chains” (NBER Working Paper No. 23996)
- Xiang Hui, MIT; Maryam Saedi, Carnegie Mellon University; Steven Tadelis, University of California, Berkeley and NBER; and Giancarlo Spagnolo, SITE-Stockholm School of Economics, “Certification, Reputation, and Entry: An Empirical Analysis” (NBER Working Paper No. 23583)
- John C. Haltiwanger, University of Maryland and NBER; Robert Kilduff, NERA Economic Consulting; and Chad Syverson, University of Chicago and NBER, “Misallocation Measures: The Distortion That Are the Residual” (NBER Working Paper No. 24199)
- Selin Akca, University of Zurich, and Anita Rao, University of Chicago, “Value of Search Aggregators” (NBER Working Paper No. 23583)
- Ying Li, Cornerstone Research; Joe Mazur, Purdue University; Yongjuon Park, University of Maryland; James R. Roberts, Duke University and NBER; Andrew Sweeting, University of Maryland and NBER; and Jun Zhang, University of Maryland, “Endogenous and Selective Service Choices After Airline Mergers” (NBER Working Paper No. 24214)

Summaries of these papers are at: www.nber.org/confer/2018/IOs18/summary.html

Law and Economics

Members of the NBER’s Law and Economics Program met in Cambridge on February 16. Program Director Christine Jolls of Yale University organized the meeting. These researchers’ papers were presented and discussed:

- Lauren Cohen, Harvard University and NBER, and Umit Gurun, University of Texas at Dallas, “Buying the Verdict” (NBER Working Paper No. 23583)
- Cäzilia Loibl, The Ohio State University; Lucia Reisch, Copenhagen Business School; Julius Rauber, Zeppelin University; and Cass R. Sunstein, Harvard University, “Which Europeans Like Nudges? Approval and Controversy in Four European Countries” (NBER Working Paper No. 23583)

Summaries of these papers are at: www.nber.org/confer/2018/LEs18/summary.html

Labor Studies

Members of the NBER’s Labor Studies Program met at the Federal Reserve Bank of San Francisco on February 15–16. Program Codirectors David Autor of MIT and Alexandre Mas of Princeton University organized the meeting. These researchers’ papers were presented and discussed:

- Richard Hornbeck, University of Chicago and NBER, and Enrico Moretti, University of California, Berkeley and NBER, “Who Benefits from Productivity Growth? The Direct and Indirect Effects of Local TFP Shocks” (NBER Working Paper No. 23583)

Summaries of these papers are at: www.nber.org/confer/2018/IOs18/summary.html
Economic Fluctuations and Growth

Members of the NBER’s Economic Fluctuations and Growth Program met in San Francisco on February 23. Research Associates Andrew Atkeson of the University of California, Los Angeles and Monika Piazzesi of Stanford University organized the meeting. These researchers’ papers were presented and discussed:

- Matteo Maggiori, Harvard University and NBER; Brent Neiman, University of Chicago and NBER; and Jesse Schreger, Columbia University and NBER, “International Currencies and Capital Allocation”
- Marcus Hagedorn, University of Oslo; Jourii Manovskii, University of Pennsylvania and NBER; and Kurt Mitman, Institute for International Economic Studies, “The Fiscal Multiplier”
- Fatih Guvenen, University of Minnesota and NBER; Guergui Kambourov and Burhanettin Karuscu, University of Toronto; Sergio Ocampo-Díaz, University of Minnesota; and Daphne Chen, Florida State University, “Use It Or Lose It: Efficiency Gains from Wealth Taxation”
- Carlos Garriga, Federal Reserve Bank of St. Louis, and Aaron Hedin, University of Missouri, “Housing Finance, Boom-Bust Episodes, and Macroeconomic Fragility”

Summaries of these papers are at: www.nber.org/confer/2018/EFGw18/summary.html

Monetary Economics

Members of the NBER’s Monetary Economics Program met at the Federal Reserve Bank of New York on March 1-2. Faculty Research Fellows Nancy Qian of Northwestern University, working group Director Shang-Jin Wei of Columbia University, and Research Associate Daniel Xu of Duke University organized the meeting. These researchers’ papers were presented and discussed:

- Itamar Drehoker, Alexi Savov, and Philipp Schnabl, New York University and NBER, “Banking on Deposits: Maturity Transformation without Interest Rate Risk”
- Julian Kozlowski, New York University, and Laura Veldkamp and Venky Venkateswaran, New York University and NBER, “The Tail that Keeps the Riskless Rate Low” (NBER Working Paper No. 24362)
- Chen Lian, MIT, and Yuehan Ma, Harvard University, “Anatomy of Corporate Borrowing Constraints”
- Francisco J. Buera, Washington University in St. Louis, and Sudipto Karmakar, Banco de Portugal, “Real Effects of Financial Distress: The Role of Heterogeneity”
- Anmol P. Bhandari, University of Minnesota; David Evans, University of Oregon; Mikhail Golosov, University of Chicago and NBER; and Thomas J. Sargent, New York University and NBER, “Inequality, Business Cycles, and Monetary-Fiscal Policy”
- Emmanuel Farhi, Harvard University and NBER, and David Baqaee, London School of Economics, “Productivity and Misallocation in General Equilibrium” (NBER Working Paper No. 24007)

Summaries of these papers are at: www.nber.org/confer/2018/MEs18/summary.html

Chinese Economy

The NBER’s Working Group on the Chinese Economy met in Cambridge on March 2–3. Faculty Research Fellow Nancy Qian of Northwestern University, working group Director Shang-Jin Wei of Columbia University, and Research Associate Daniel Xu of Duke University organized the meeting. These researchers’ papers were presented and discussed:

- Harald Hau, University of Geneva; Yi Huang, The Graduate Institute, Geneva; and Hongzhao Shan, Swiss Finance Institute, “TechFin at Ant Financial: Credit Market Completion and its Growth Effect”
- Panle Jia Barwick, Cornell University and NBER; Dave Donaldson, MIT and NBER; Shanjun Li, Cornell University and NBER; and Yatang Lin, Hong Kong University of Science and Technology, “The Welfare Effects of Passenger Transportation Infrastructure: Evidence from China”
- Yuyu Chen, Peking University, and David Yifan Yang, Stanford University, “The Impact of Media Censorship: Evidence from a Field Experiment in China”
- Hui He, International Monetary Fund, and Lei Ning and Dongming Zhu, Shanghai University of Finance and Economics, “The Impact of Rapid Aging and Pension Reform on Savings and the Labor Supply: The Case of China”
- Shang-Jin Wei and Jianhuan Xu and JungHo Lee, Singapore Management University, “Trade Imbalance as a Source of Comparative Disadvantage: Why Does China Import So Much Waste?”
- Guojun He, Hong Kong University of Science and Technology; Shaoda Wang, University of California, Berkeley; and Bing Zhang, Nanjing University, “Environmental Regulation and Firm Productivity in China: Estimates from a Regression Discontinuity Design”
- Hanming Fang, University of Pennsylvania and NBER, Zhe Li and Nianhang Xu, Renmin University of China; and Hongjun Yan, DePaul University, “In the Shadows of Government: Political Turnovers and Firm Perk Expenses”
- Pierre-André Chiappori, Columbia University; David Ong, Peking University; Yu Yang, University of Wisconsin-Madison; and Junsen Zhang, Chinese University of Hong Kong, “Marrying Up: Trading Off Spousal Income and Spousal Height”
- Loren Brandt and Guergui Kambourov, University of Toronto, and Kjetil Storesletten, University of Oslo, “Barriers to Entry and Regional Economic Growth in China”

Summaries of these papers are at: www.nber.org/confer/2018/CEs18/summary.html
Environment and Energy Economics

Members of the NBER’s Environment and Energy Economics Program met in Cambridge on March 8–9. Faculty Research Fellow Tatyana Deryugina of the University of Illinois at Urbana-Champaign and Research Associate Matthew Kotchen of Yale University organized the meeting. These researchers’ papers were presented and discussed:

- Paule Jia Barwick and Shanjun Li, Cornell University and NBER, and Dewu Rao and Nahim B. Zahur, Cornell University, “Air Pollution, Health Spending, and Willingness to Pay for Clean Air in China”
- Robin Burgess, London School of Economics; Jonathan M. Colmer, University of Virginia; and Michael Greenstone, University of Chicago and NBER, “The Economics of Marine Conservation”
- Mark J. Borgschulte, University of Illinois at Urbana-Champaign; David Molitor, University of Illinois at Urbana-Champaign and NBER; and Eric Zou, Illinois University, “Smoked Out: The Effect of Wildfire Smoke on Labor Market Outcomes”
- Nicholas Muller, Carnegie Mellon University and NBER, “Individual Discount Rates during the Great Depression: Evidence from Firewood Prices in Portland, Oregon”
- Jeffrey G. Shrader, Jr., New York University, “Expectations and Adaptation to Environmental Risks”
- Tatyana Deryugina and David Molitor, “Long-Ran Health Dynamics in the Wake of Disaster: Evidence from Hurricane Katrina”
- Leslie A. Martin and Samuel J. Thornton, University of Melbourne, “To Drive or Not to Drive? A Field Experiment in Road Pricing”
- Paramita Sinha, Research Triangle Institute; Martha L. Caulkins, University of Maryland; and Maureen L. Cropper, University of Maryland and NBER, “Do Discrete Choice Approaches to Valuing Urban Amenities Yield Different Results than Hedonic Models?” (NBER Working Paper No. 24290)
- Bryan Bollinger, Duke University; Jesse Burkhardt, Colorado State University; and Kenneth Gillingham, Yale University and NBER, “Peer Effects in Water Conservation: Evidence from Consumer Migration”

Summaries of these papers are at: www.nber.org/confer/2018/EEEs18/summary.html

Aging

Members of the NBER’s Aging Program met in Cambridge on March 8–9. Program Director Jonathan S. Skinner of Dartmouth College and Research Associate Kathleen M. McGarry of the University of California, Los Angeles organized the meeting. These researchers’ papers were presented and discussed:

- Timothy Layton and Nicole Maestas, Harvard University and NBER; Daniel Prinz, Harvard University; and Boris Vaubson, Stanford University, “The Consequences of (Partial) Privatization of Social Insurance for Individuals with Disabilities: Evidence from Medicaid”
- Kevin S. Milligan, University of British Columbia and NBER, and Tammy Schirle, Wilfrid Laurier University, “Earnings, Mortality, and the Distribution of Longevity”
- Liran Einav, Stanford University and NBER; Amy Finkelstein, MIT and NBER; Sendhil Mullainathan, Harvard University and NBER; and Ziad Obermeyer, Partners Healthcare, “Does High Healthcare Spending at End of Life Imply Waste? Predictive Modeling Suggests Not Necessarily”
- Silvia H. Barcellos and Leandro Carvalho, University of Southern California, and Patrick Turley, Harvard University, “Distributional Effects of Education on Health”
- John Beshears, David Laibson, and Brigitte C. Madrian, Harvard University and NBER; James J. Choi, Yale University and NBER; and Bill Skimmynhorn, United States Military Academy, “Borrowing to Save? The Impact of Automatic Enrollment on Debt”
- David Cutler, Harvard University and NBER, “Is Aging a Luxury Good?”

Summaries of these papers are at: www.nber.org/conf/2018/AGs18/summary.html

International Finance and Macroeconomics

Members of the NBER’s International Finance and Macroeconomics Program met in Cambridge on March 8–9. Research Associates Emmanuel Farhi of Harvard University and Brent Neiman of the University of Chicago organized the meeting. These researchers’ papers were presented and discussed:

- Anil Ari, International Monetary Fund, “Sovereign Risk and Bank Risk-Taking”
- Bill Skimmyhorn, United States Military Academy, “Borrowing to Save? The Impact of Automatic Enrollment on Debt”
- Liran Einav, Stanford University and NBER; Amy Finkelstein, MIT and NBER; Sendhil Mullainathan, Harvard University and NBER; and Ziad Obermeyer, Partners Healthcare, “Does High Healthcare Spending at End of Life Imply Waste? Predictive Modeling Suggests Not Necessarily”
- James J. Choi, Yale University and NBER; and Bill Skimmynhorn, United States Military Academy, “Borrowing to Save? The Impact of Automatic Enrollment on Debt”
- David Cutler, Harvard University and NBER, “Is Aging a Luxury Good?”

Summaries of these papers are at: www.nber.org/conf/2018/IFMs18/summary.html
International Trade and Investment

Members of the NBER’s International Trade and Investment Program met in Cambridge on March 16–17. The meeting focused on “Trade and Geography.” International Trade and Investment Program Director Stephen J. Redding and Research Associate Esteban Rossi-Hansberg, both of Princeton University, organized the meeting. These researchers’ papers were presented and discussed:

- Enrique Berkes, Northwestern University, and Ruben Gaetani, University of Toronto, “Income Segregation and Rise of the Knowledge Economy”
- Fabian Eckert, Yale University, and Michael Peters, Yale University and NBER, “Spatial Structural Change”
- Bernt Bratsberg and Oddbjorn Raam, Frisch Centre, Oslo, and Andreas Moxnes and Karen Helene Ulltveit-Moe, University of Oslo, “Opening the Floodgates: Immigration and Structural Change”
- Peter Egger and Nicole Loumeau, ETH Zurich, “The Economic Geography of Innovation”
- Jeffrey C. Brinkman and Jeffrey Lin, Federal Reserve Bank of Philadelphia, “Freeway Revolt!”
- Nelson Lind, Emory University, and Natalia Ramondo, University of California, San Diego and NBER, “Trade with Correlation” (NBER Working Paper No. 24380)
- Shushanik Hakobyan, International Monetary Fund, and John McLaren, University of Virginia and NBER, “Local-Labor-Market Effects of NAFTA: The Other Shoe Drops”

Summaries of these papers are at: www.nber.org/confer/2018/TGs18/summary.html

Productivity, Innovation, and Entrepreneurship

Members of the NBER’s Productivity, Innovation, and Entrepreneurship Program met in Cambridge on March 16–17. The meeting focused on “Productivity.” Productivity, Innovation, and Entrepreneurship Program Co-Directors Steven N. Durlauf and Alan B. Krueger, both of Princeton University, organized the meeting. These researchers’ papers were presented and discussed:

- Eunhee Sohn, Georgia Institute of Technology, and Robert Seamsans and Daniel Sands, New York University, “Technological Opportunity and the Locus of Innovation: Aircraft, Aircraft, and Local Capabilities”
- Ernest Liu, Princeton University, Atif R. Mian, Princeton University and NBER, and Amir Sufi, University of Chicago and NBER, “Low Interest Rate and Productivity Growth”
- Stefano Dell’Aquila, University of California, Berkeley and NBER, and Matthew Gentzkow, Stanford University and NBER, “Uniform Pricing in U.S. Retail Chains” (NBER Working Paper No. 23996)

Summaries of these papers are at: www.nber.org/confer/2018/TGs18/summary.html

Development of the American Economy

Members of the NBER’s Development of the American Economy Program met in Cambridge on March 24. Program Co-Directors Leah Platt Boustan of Princeton University and William J. Collins of Vanderbilt University organized the meeting. These researchers’ papers were presented and discussed:

- Samuel Bazzi and Mesay Melse Gebreslassie, Boston University, and Martin Fitzbein, Boston University and NBER, “Frontier Culture: The Roots and Persistence of ‘Rugged Individualism’ in the United States”
- Vellore Arthi, University of Essex; Brian Beach, College of William and Mary and NBER; and Walker Hanlon, New York University and NBER, “Estimating the Recession-Mortality Relationship when Migration Matters” (NBER Working Paper No. 23507)
- Taylor Jaworski, University of Colorado at Boulder and NBER, and Carl Kittchen, Florida State University and NBER, “The Interstate Highway System and the Development of the American Economy”
- Gregorri Galofré-Vila, University of Oxford; Christopher M. Meissner, University of California, Davis and NBER; Martin McKee, London School of Hygiene; and David Stuckler, Bocconi University, “Austerity and the Rise of the Nazi Party” (NBER Working Paper No. 24106)
- Robert A. Margo, Boston University and NBER, “The Integration of Economic History into Economics” (NBER Working Paper No. 23538)

Summaries of these papers are at: www.nber.org/confer/2018/PRs18/summary.html
Health care costs represent nearly 18 percent of U.S. gross domestic product and 20 percent of government spending. While there is detailed information on where these health care dollars are spent, there is much less evidence on how this spending affects health.

The research in Measuring and Modeling Health Care Costs seeks to connect our knowledge of expenditures with what we are able to measure of results, probing questions of methodology, changes in the pharmaceutical industry, and the shifting landscape of physician practice. Some examples: research in this volume investigates obesity’s effect on health care spending, the effect of generic pharmaceutical releases on the market, and the disparity between disease-based and population-based spending measures. This vast and varied volume applies a range of economic tools to the analysis of health care and health outcomes.

Practical and descriptive, this new volume in the Studies in Income and Wealth series is full of insights relevant to health policy students and specialists alike.

U.S. Engineering in a Global Economy

Since the late 1950s, the engineering job market in the United States has been fraught with fears of a shortage of engineering skill and talent. U.S. Engineering in a Global Economy brings clarity to issues of supply and demand in this important market. Following a general overview of engineering-labor market trends, the volume examines the educational pathways of undergraduate engineers and their entry into the labor market, the impact on productivity and innovation of engineers working in firms, and various dimensions of the changing engineering labor market, from licensing to changes in demand and guest worker programs.

The volume provides insights on engineering education, practice, and careers that can inform educational institutions, funding agencies, and policy makers about the challenges facing the United States in developing its engineering workforce in the global economy.

Women Working Longer: Increased Employment at Older Ages

Today, more American women than ever before stay in the workforce into their sixties and seventies. This trend emerged in the 1980s and has persisted for decades, despite substantial changes in macroeconomic conditions. Today’s older American women work full-time jobs at greater rates than women in other developed countries. Why is this so?

In Women Working Longer, editors Claudia Goldin and Lawrence F. Katz assemble new research that presents fresh insights on the phenomenon. Their findings suggest that education and work experience earlier in life are connected to women’s later-in-life work. Other contributors to the volume investigate additional factors that may play a role in late-life labor supply, such as marital disruption, household finances, access to retirement benefits. A pioneering study of recent trends in older women’s labor force participation, this collection offers insights valuable to a wide array of social scientists, employers, and policy makers.

Innovation Policy and the Economy, Volume 18

The 18th annual volume of the NBER’s Innovation Policy and the Economy series focuses on research exploring the interplay between new technologies and organizational structures, such as networks and corporations. Glenn Ellison and Sara Fisher Ellison explore how consumer search in a technology-mediated marketplace can affect the incentives for firms to engage in price obfuscation. Aaron Chatterji focuses on the role of innovation in American primary and secondary education (K–12), emphasizing recent evidence on the efficacy of classroom technologies. Economic sociologist Olav Sorenson considers how information, influence, and resources flow through innovation networks. The last two chapters focus on how corporate organizational structures influence innovation and dynamism. Andreas Nilsson and David Robinson develop a synthetic framework for understanding the emergence and choices of social entrepreneurs and socially responsible firms. In the fifth chapter, Steven Kaplan argues that there is little empirical evidence to support the common claim that investor pressure for short-term financial results leads U.S. companies to underinvest systematically in long-term capital expenditures and R&D.