

# NBER Reporter

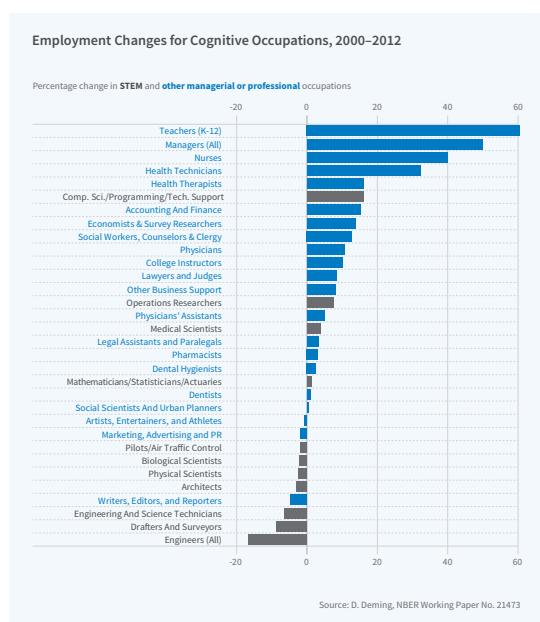
NATIONAL BUREAU OF ECONOMIC RESEARCH

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## Program Report

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## Industrial Organization

Liran Einav and Jonathan Levin\*

Researchers in the Program on Industrial Organization (IO) study consumer and firm behavior, competition, innovation, and government regulation. This report begins with a brief summary of general developments in the last three decades in the range and focus of program members' research, then discusses specific examples of recent work.

When the program was launched in the early 1990s, two developments had profoundly shaped IO research. One was development of game-theoretic models of strategic behavior by firms with market power, summarized in Jean Tirole's classic textbook.<sup>1</sup> The initial wave of research in this vein was focused on applying new insights from economic theory; empirical applications came later. Then came development of econometric methods to estimate demand and supply parameters in imperfectly competitive markets. Founding program members including Timothy Bresnahan,<sup>2</sup> Ariel Pakes,<sup>3</sup> and Robert Porter<sup>4</sup> played a key role in advancing this work.

Underlying both approaches was the idea that individual industries are sufficiently distinct and industry details sufficiently important that one needs to focus on specific markets and industries in order to test specific hypotheses about consumer or firm behavior, or to estimate models that could be used for counterfactual analysis, such as analysis of a merger or regulatory change. The econometric developments in the field, which emphasized structural modeling of demand and supply, ran somewhat counter to the trend in other fields toward the search for natural experiments to illuminate the causal effects of policy changes.

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There were, to be sure, some points of overlap with neighboring fields. A notable example was the role that industrial organization economists played in the activities of the NBER's Program on Productivity, Innovation, and Entrepreneurship (PRIE), where the research agenda embraced the estimation of plant-level costs and productivity and the effects of firm and market characteristics on R&D spending and the rate of innovation.

In the last decade, the scope of program members' research has broadened to encompass more industries and new topics. While studies of traditional manufacturing, service, and retail settings remain an important focus, there has been a rapid growth of research on sectors such as health care,<sup>5</sup> education,<sup>6</sup> financial markets,<sup>7</sup> and the media.<sup>8</sup>

### Expanding the Scope of Research

A nice way to illustrate the increase in the breadth of IO research is to examine the rate at which IO program members cross-list their papers with other NBER programs. We analyzed all NBER working papers since 1990 on which at least one author was an IO program affiliate, then computed the share of these papers that were cross-listed with another program. We considered only programs in which at least 5 percent of the papers by IO researchers were cross-listed.

Figure 1 plots our findings. It shows an interesting evolution of cross-listing behavior in the last 15 years. While productivity remains a nontrivial focus of work in IO, there has been a remarkable increase in the share of IO papers cross-listed in other fields of applied microeconomics. This started in the early 2000s in the context of environmental regulation and energy—especially electricity—markets, and continued in the last decade with a sharp rise in research on health care markets, insurance markets, labor markets, and on topics that overlap with public economics. While the cross-listing rate with programs other than PRIE was nearly zero in the program's first decade, today nearly 20 percent of IO program papers are cross-listed with Public Economics, 20 percent with Health Care, 15 percent with Environment and Energy Economics, and 10 percent with Labor Studies. We think that two general

Cross-Listing of NBER's IO Program Working Papers, 1991–2017

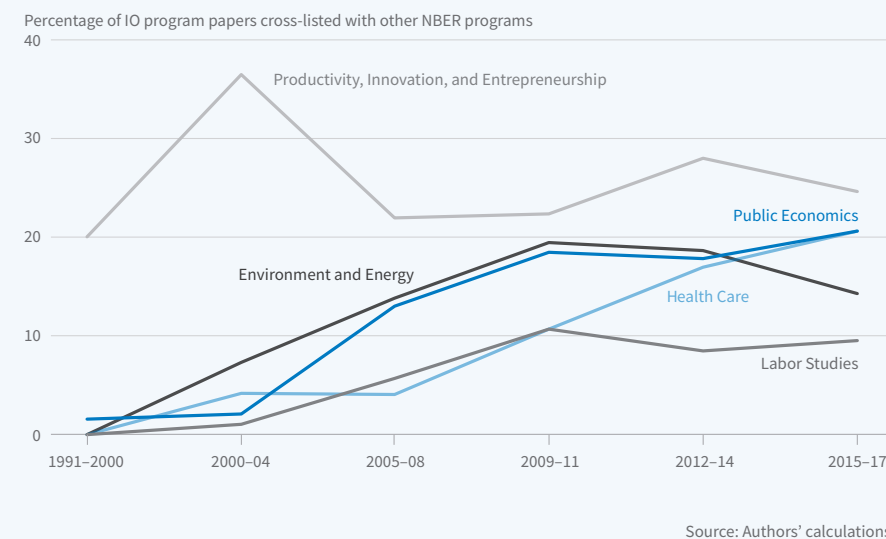


Figure 1

forces have contributed to this new pattern, which in keeping with the program's emphasis one may label as supply and demand.

On the supply side, econometric methods for studying imperfect completion have matured: From initial "test cases" using retail scanner data to estimate demand and supply for consumer products such as breakfast cereal and other grocery items, these methods increasingly are applied to more complex products such as health insurance, primary schooling, consumer loans, media consumption, and financial products. The explosion of available data from private sector firms and markets has paralleled and facilitated this expansion.

On the demand side, there has been a large shift in many markets, such as electricity and health care, toward regulated competition. Some of these

changes have grown out of changes in U.S. regulatory structure which, starting in the 1980s, prioritized private sector competition as the favored approach to improve efficiency and foster innovation. At the same time, there has been an increasing appreciation of the importance of market power in a wide range of industries, such as health care, financial services, retailing, and media. Indeed, these changes continue to be some of the most significant in the U.S. economy, suggesting bright prospects for the relevance and importance of industrial organization research in coming years.

### Examples of Recent Research

To illustrate the broadening of research by industrial organization economists, we now summarize several specific papers. We have chosen these

examples to underscore the broadening spectrum of industries and topics addressed by program members and the variety of approaches and tools being used to study competition and markets. These examples are not meant to be a summary of the much broader scope of research by program affiliates. All of the recent working papers by program affiliates may be found at [www.nber.org/papersbyprog/IO.html](http://www.nber.org/papersbyprog/IO.html). This body of research includes large swaths of work on trade, media, political economy, and energy, as well as traditional competition policy, innovation, and regulation topics.

### Competition in Health Insurance Markets

The U.S. health care system increasingly revolves around regulated health care markets. Today, 11 million Americans are enrolled in health plans through Affordable Care Act (ACA) exchanges, 17 million in Medicare Advantage plans, 55 million in managed Medicaid plans, and 41 million in Medicare Part D plans. In each case, private insurers compete under market rules that regulate contract features, pricing, and risk adjustment. Larger employers frequently also sponsor health plan choice, again creating an environment of managed competition. These developments raise important questions about market power, market design, and asymmetric information.

Competition has been a central concern because health insurance markets are heavily concentrated. In the California Health Insurance Exchange, four insurers have 95 percent of the market. Insurer concentration is even higher in many state exchanges and Medicare Advantage regions. In tra-

### The Program on Industrial Organization

The Program on Industrial Organization (IO) was founded in 1990, and grew steadily under the leadership of Nancy Rose, who led the program from its inception until 2014. Jonathan Levin served as program director from 2014 until 2016, when he became dean of the Stanford Graduate School of Business and was succeeded by Liran Einav. The IO program currently has 83 members and holds a winter meeting on the West Coast and a summer meeting during the NBER Summer Institute. Program meetings were known for many years for their nontraditional "discussant presents" format, although in recent years they have more often adhered to the traditional "author presents" model.

ditional markets, market power raises consumer prices. This point is sometimes contested in health insurance markets because hospitals and health care providers similarly enjoy considerable market power, and a dominant health insurer may enjoy the ability to negotiate favorable prices, lowering costs for consumers.

Many recent papers by IO program members have studied this situation. For example, Kate Ho and Robin Lee examine health plan choice sponsored by CalPERS for California's roughly 1.2 million state employees.<sup>9</sup> Using data on plan choices, medical claims, and prices insurers pay to hospitals, they develop an econometric model of hospital-insurer bargaining, premium setting, plan choice, and health care utilization, and simulate the effect of having fewer insurers.

Their analysis highlights the importance of both traditional market power and bargaining power following a hypothetical merger. Holding hospital prices fixed, a merger raises consumer premiums, but in some markets, greater leverage in bargaining not only counteracts this direct effect but leads to overall lower consumer prices. Ho and Lee show how the magnitude of the competing effects varies across cities and market configurations.

Another study, by Benjamin Handel, Igal Hendel, and Michael Whinston, examines a key issue in the ACA exchanges, again from a quantitative perspective.<sup>10</sup> Their research, which recently received the Econometric Society's Frisch Medal, focuses on the costs and benefits of "community rating," under which insurers are not allowed to charge differential premiums based on health status. Community rating protects individuals with pre-existing conditions, and in a forward-looking sense protects healthy individuals who might in the future become sick, insuring them against what is sometimes called "reclassification risk." However, it also creates the potential for adverse selection if healthy people opt out to avoid paying high premiums, or choose stripped-down plans. Much

of the debate around the ACA has centered on these dynamics and how best to address them.

Handel, Hendel, and Whinston develop an elegant model that allows them to study this situation empirically, combining the classic adverse selection theory with detailed plan choice and claims data from a large private employer to estimate the key demand and supply parameters. Among many interesting findings, their results suggest that higher-income employees would do better under health-based pricing, although not by that much, while community rating, as under the ACA, is hugely important for lower-income workers or for workers on something resembling a fixed income, which may be more representative of the current mix of ACA enrollees.

Both of these studies illustrate the power of using quantitative models. The theoretical trade-offs are well understood, but there is no clear idea of which effect is more important, so detailed data and an econometric model can help.

#### Financial Market Microstructure

The design of market institutions and the potential for market failures resulting from design choices have been major themes at recent IO program meetings. Our second example is drawn from financial markets and again illustrates the breadth of industry focus among NBER IO members and the diversity of methodological approaches.

The last 15 years or so have seen a big shift in financial markets toward electronic trading. One of the phenomena associated with this has been the emergence of high-frequency trading and the associated race for speed, with large financial firms making large investments in network infrastructure to procure a speed advantage in getting their orders to the electronic exchange.

Eric Budish, Peter Cramton, and John Shim have studied this development and analyzed the potential consequences of shifting from continuous trading to trading in discrete, albeit

closely spaced, intervals.<sup>11</sup> They use a striking example to demonstrate the arbitrage opportunities created for high-frequency traders (HFTs) in current markets. The example involves two contracts that track the S&P 500, an exchange-traded fund (ETF) that trades in New York and a futures contract that trades in Chicago. The securities move together with near-perfect correlation on a second-by-second time scale. But at a finer resolution of milliseconds the correlation breaks down, because when there is a trade on one contract that moves its price up or down, it takes several milliseconds for quotes on the other contract to adjust. During that interval, an arbitrage opportunity exists and, with sufficient speed, a trader may be able to see a trade in one market and execute a trade against a "stale" quote in the other market.

Remarkably, the time for these arbitrage gaps to close has narrowed dramatically as firms have invested in increasingly fast communication technology, but the dollar magnitude of the opportunities has remained constant. The reason is that if the price in Chicago ticks up one index point, and the trader's buy order gets to New York before the price change, the profit is one index point, regardless of how fast this happens. So the incentive to be fastest does not go away as everyone gets faster.

Budish, Cramton, and Shim develop a simple model to analyze this speed race in public equity markets and organize the empirical facts described above. In their model, HFTs endogenously play two roles. First, they compete to create liquidity—to post bids and asks—which is good for regular traders. Second, they compete to "snipe" stale quotes, which creates a problem for people who post bids and asks and leads to wider bid/ask spreads and reduced market liquidity. The researchers argue that the problem is not HFTs per se. Rather, it is the market rules that foster competition on speed by prioritizing trades based on their arrival time rather than their price.

They analyze alternative market design rules and suggest that moving from continuous time trading to what they call frequent batch auctions (auctions that run at frequent, fixed intervals—for example, every tenth of a second) might improve the efficiency of public equity markets. This possibility has attracted attention from the Securities and Exchange Commission and other regulators.

#### Digital Advertising

Researchers have become increasingly interested in the nature of competition and the determinants of firm behavior in the digital economy. One example of research in this area concerns the market for internet search advertising. Internet advertising is among the fastest-growing industries, with search advertising revenues of approximately \$37 billion in 2017. Google and Facebook have become two of the world's largest companies on the strength of their advertising sales.

Relative to traditional advertising, such as television commercials, a common argument for internet advertising, and especially search advertising, is that it solves the fundamental problem in the industry—the problem that half the money is wasted and no one knows which half. Internet advertising, so the argument goes, can be measured and targeted. As the industry has grown, researchers have focused on trying to assess just how much value is created in digital advertising, how effective it is in swaying people's behavior, and how any resulting surplus is divided between consumers, advertisers, and internet platforms.

One paper that illustrates recent research in this area is by Thomas Blake, Chris Nosko, and Steven Tadelis.<sup>12</sup> Their study is also an example of a recent trend in the field toward working with private companies—sometimes to get access to their data, in other cases to run experiments. This project got started when Tadelis and Nosko were on leave at eBay and Blake was a full-time economist there, with the project presumably generating value

(or at least interest) for eBay, while also being of significant academic interest.

The study begins with the observation that it is not necessarily easy to measure the value of search advertising. The researchers illustrate this point by making a distinction between "non-branded search" and "branded search." In the first case, a consumer may search for, say, a guitar, and search ads may direct him or her to specific sellers. In the second case, if the consumer searches for, say, "Macy's," he or she may see Macy's advertising in response to this search, although it seems natural to conjecture that he or she would have ended up on Macy's website even without seeing the ad. But a naïve data analysis may suggest that Macy's ad is incredibly successful because many people are likely to click on the ad and get to Macy's.

To study this question, Blake, Nosko, and Tadelis design and report on a large-scale experiment they ran in collaboration with eBay in which they shut down advertising for 30 percent of the company's U.S. internet traffic for two months and measured the results. They first experiment by shutting down advertising against the keyword "eBay." As may have been conjectured, shutting down "branded search ads" makes little difference. Without the ad, users simply click on the organic search result and find their way to the eBay website, and the overall number of clicks on the site remains essentially constant.

They then go to the non-branded search advertising, and shut down eBay advertising for generic keywords such as "guitar" in randomly selected geographic areas in the United States. The overall effect is not zero, but it is small. The authors break down the estimated impact by frequency and recency of the user (how many times and how recently they have visited eBay), and show that search advertising for eBay is effective when the ads are shown to users who are not eBay shoppers already, or who have not been to eBay in a long time. Such users account for a relatively small share of the overall volume, explaining

the small aggregate effect. Although many advertisers on Google are not well known to searchers, most people are so aware of eBay, and potentially of other large advertisers, that they don't need Google to find it.

<sup>1</sup> J. Tirole, *The Theory of Industrial Organization*, Cambridge, Massachusetts: The MIT Press, 1988.

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<sup>2</sup> T. Bresnahan and P. Reiss, "Entry and Competition in Concentrated Markets," *Journal of Political Economy*, 99(5), 1991, pp. 977–1009.

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<sup>3</sup> S. Berry, J. Levinsohn, and A. Pakes, "Automobile Prices in Market Equilibrium," *NBER Working Paper No. 4264*, January 1993; and *Econometrica*, 63(4), 1995, pp. 841–90.

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<sup>4</sup> R. Porter, "The Role of Information in U.S. Offshore Oil and Gas Lease Auctions," *NBER Working Paper No. 4185*, October 1992, and *Econometrica*, 63(1), 1995, pp. 1–27.

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<sup>5</sup> K. Ho and R. Lee, "Insurer Competition in Health Care Markets," *NBER Working Paper No. 19401*, September 2013; and *Econometrica*, 85(2), 2017, pp. 379–417; B.

Handel, I. Hendel, and M. Whinston, "Equilibria in Health Exchanges: Adverse Selection vs. Reclassification Risk," *NBER Working Paper No. 19399*, September 2013, and *Econometrica*, 83(4), 2015, pp. 1261–1313.

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<sup>6</sup> D. Deming, J. Hastings, T. Kane, and D. Staiger, "School Choice, School Quality and Postsecondary Attainment," *NBER Working Paper No. 17438*, September 2014, and *American Economic Review*, 104(3), 2014, pp. 991–1013; N. Agarwal and P. Somaini, "Demand Analysis using Strategic Reports: An Application to a School Choice Mechanism," *NBER Working Paper No. 20775*, December 2014, and *Econometrica*, forthcoming.

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<sup>7</sup> E. Budish, P. Cramton, and J. Shim,

*“The High-Frequency Trading Arms Race: Frequent Batch Auctions as a Market Design Response,”* presented in the NBER IO Summer 2014 meeting, and Quarterly Journal of Economics, 130(4), 2015, pp. 1547–621; A. Hortacsu, J. Kastl, and A. Zhang, “Bid Shading and Bidder Surplus in the U.S. Treasury Auction System,” NBER Working Paper No. 24024, November 2017, and American Economic Review, forthcoming.

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<sup>8</sup> M. Gentzkow and J. Shapiro, “What Drives Media Slant? Evidence from U.S. Daily Newspapers,” NBER Working Paper No. 12707, November 2006, and Econometrica, 78(1), 2010, pp. 35–71;

G. Crawford, R. Lee, M. Whinston, and A. Yurukoglu, “The Welfare Effects of Vertical Integration in Multichannel Television Markets,” NBER Working Paper No. 21832, December 2015.

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<sup>9</sup> K. Ho and R. Lee, “Insurer Competition in Health Care Markets,” NBER Working Paper No. 19401, September 2013; and Econometrica, 85(2), 2017, pp. 379–417.

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<sup>10</sup> B. Handel, I. Hendel, and M. Whinston, “Equilibria in Health Exchanges: Adverse Selection vs. Reclassification Risk,” NBER Working Paper No. 19399, September 2013, and Econometrica, 83(4), 2015, pp. 1261–313.

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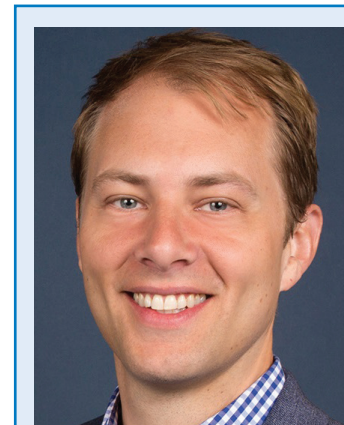
<sup>11</sup> E. Budish, P. Cramton, and J. Shim, “The High-Frequency Trading Arms Race: Frequent Batch Auctions as a Market Design Response,” presented in the NBER IO Summer 2014 meeting, and Quarterly Journal of Economics, 130(4), 2015, pp. 1547–621.

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<sup>12</sup> T. Blake, C. Nosko, and S. Tadelis, “Consumer Heterogeneity and Paid Search Effectiveness: A Large Scale Field Experiment,” NBER Working Paper No. 20171, May 2014; and Econometrica, 83(1), 2015, pp. 155–74.

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## Research Summaries



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Deming’s research focuses broadly on the economics of skill development, education, and the labor market. He received the Early Career Award from the Association for Education Finance and Policy and was named a William T. Grant Scholar in 2013.

### The Value of Soft Skills in the Labor Market

David J. Deming

Economists are increasingly focused on the importance of so-called “soft skills” for labor market success. The evidence is overwhelming that these skills—also called “non-cognitive skills”—are important drivers of success in school and in adult life.<sup>1</sup> Yet the very term soft skills reveals our lack of understanding of what these skills are, how to measure them, and whether and how they can be developed. And the term “non-cognitive” is simply used to mean “not predicted by IQ or achievement tests.”

The job market is way ahead of the ivory tower in emphasizing soft skills. Employers frequently list teamwork, collaboration, and oral and written communication skills as highly valuable yet hard-to-find qualities in potential new hires.<sup>2</sup> A 2017 survey by the National Association of Colleges and Employers found that “ability to work in a team” was the most commonly desired attribute of new college graduates. Teamwork was followed closely by written and verbal communication skills and was listed ahead of problem-solving skills, analytical/quantitative skills, and other attributes that are emphasized in formal educational settings.<sup>3</sup> Yet, until recently, economists have had very little to say about the importance of soft skills in the workplace.

In contrast, a large body of work in economics focuses on the importance of cognitive skills for wage determination. These studies typically track survey respondents from youth to adulthood and show that a “pre-market” test of cognitive skills is strongly predictive of labor market success, even after conditioning on family background, years of completed education, and other important factors.<sup>4</sup> At the macro level, advances in information technology and computerization that began in the 1980s increased the return to cognitive skills and years of completed education, which contributed to growing inequality at the upper end of the wage distribution in the 1980s and 1990s.<sup>5</sup>

#### STEM Jobs and the Slowdown in Demand for Cognitive Skills

While cognitive skills are still important predictors of labor market success, their importance has declined since 2000. An important recent paper finds significantly smaller labor market returns to cognitive skills in the early and mid-2000s, compared with the late 1980s and early 1990s.<sup>6</sup> It compares the returns to cognitive skills across the 1979 and 1997 waves of the National Longitudinal Survey of Youth (NLSY)—the same survey that was used to document the importance of cognitive skills in several influential early papers.<sup>7</sup> In a 2017 study, I replicate this finding and also show that returns to soft skills increased between the 1979 and 1997 NLSY waves.<sup>8</sup> Moreover, recent findings suggest that employment and wage growth for managerial, professional, and technical occupations stalled considerably after 2000, which the researchers argue represents a “great reversal” in the demand for cognitive skills.<sup>9</sup>

The slow overall growth of high-skilled jobs in the 2000s is driven by a decline in science, technology, engineering, and math (STEM) occupations. STEM jobs shrank as a share of all U.S. employment between 2000 and 2012, after growing strongly between 1980 and 2000. This relative decline of STEM jobs preceded the Great Recession. In contrast, between 2000 and 2012 non-STEM professional occupations such as managers, nurses, physicians, and finance and business support occupations grew at a faster rate than during the previous decade. The common thread among these non-STEM professional jobs is that they require strong analytical skills and significant interpersonal interaction. We are not witnessing an end to the importance of cognitive skills—rather, strong cognitive skills are increasingly a necessary—but not a sufficient—condition for obtaining a good, high-paying job. You also need to have social skills.

Between 1980 and 2012, social skill-inten-

sive occupations grew by nearly 12 percentage points as a share of all U.S. jobs. Wages also grew more rapidly for social skill-intensive occupations than for other occupations over this period. In contrast, both employment and wages grew more slowly for occupations with high math but low social skill requirements, including many STEM jobs. Directly comparing the returns to social skills in the NLSY 1979 and 1997 surveys, I find that social skills are a significantly more important predictor of full-time employment and wages in the more recent cohort. Employment and wage growth have been especially strong for professional jobs that require both analytical and social skills. In today's economy, workers must be able to solve complex problems in fluid, rapidly changing, team-based settings.<sup>10</sup>

### Why Are Social Skills Important in the Labor Market?

Why are social skills valued in the labor market, and why have they become more important in recent years? One possible cause is technological change. In a review article about the history of workplace automation, David Autor argues that new technologies generally increase the importance of skills and tasks for which there is still no good substitute. Machines are generally quite good—at performing routine, codifiable tasks according to a set of explicit rules. However, people are still much better at open-ended tasks that require flexibility, creativity, and judgment. Often we perform these tasks with great skill despite lacking any explicit understanding of “rules,” as when we divine the motives of a person we just met, or when we quickly determine whether it is appropriate to laugh at an off-color joke.<sup>11</sup>

Social interaction is perhaps the most necessary workplace task for which there

is currently no good machine substitute. Software exists that can manage investment portfolios, diagnose cancer and develop treatments for it, and beat humans in complex games such as chess, Go, and Jeopardy. Yet it has proven devilishly difficult to program a machine for even a short, unstructured conversation with a human being, much less to engage in the kind of flexible teamwork that is increasingly needed in the modern economy. The reason is that our ability to read and react to others is based

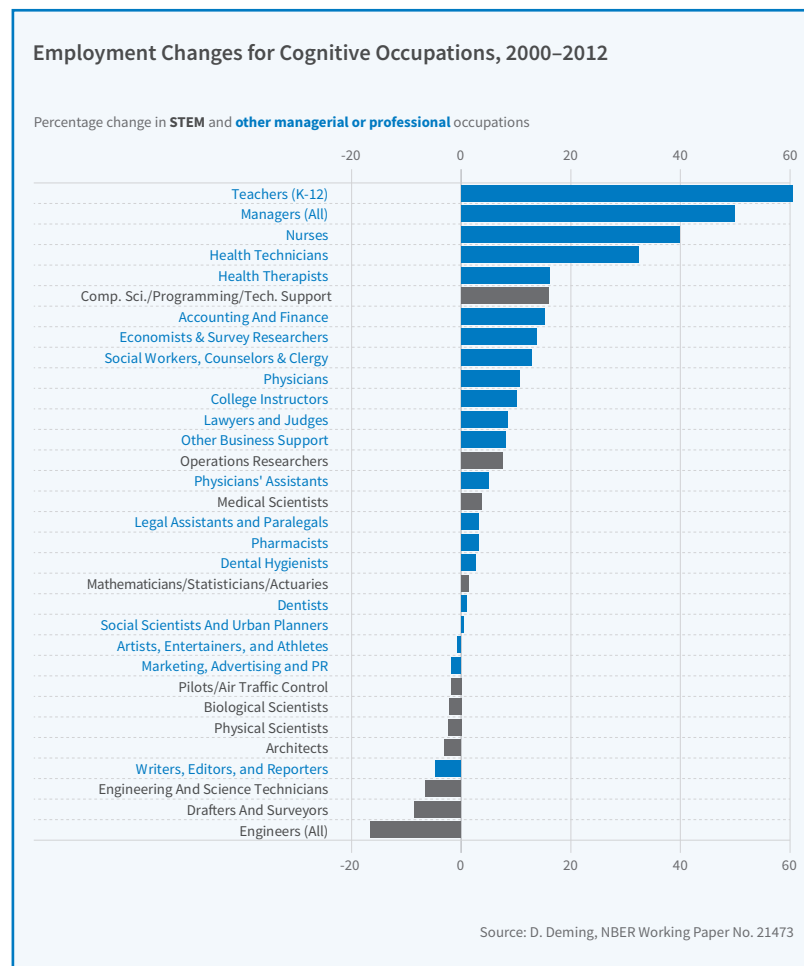


Figure 1

on tacit knowledge that has evolved over thousands of years. It is difficult to reverse-engineer a process that we do not explicitly understand.

We also see evidence of the growing importance of social skills in studies of how information and communication technology (ICT) has changed the organization of the workplace. Case studies of ICT implementation show that computerization leads to the reallocation of skilled workers into

flexible, team-based settings that facilitate adaptive responses and group problem-solving.<sup>12</sup> Across all industries and occupations, job design has shifted away from rigid categorization and toward increased job rotation and worker multitasking.<sup>13</sup>

Firms have developed automation technologies for simple social exchanges such as customer service telephone calls and requests for tickets from airport and train station kiosks. Yet this is a far cry from true social interaction, which requires not just algorithmic conversation but understanding. Teamwork requires the capacity to understand the motivations of others. Working effectively with others means not only observing their behavior but also understanding *why* they act the way they do. Psychologists call this “theory of mind”—the ability to attribute mental states to others based on their behavior, or, more colloquially, to “put oneself into another’s shoes.”<sup>14</sup>

Why would theory of mind be useful in the workplace? Workers vary naturally in their abilities over a large variety of workplace tasks, and thus individuals with similar average skill levels have a comparative advantage in different tasks. Much as Ricardo postulated that countries specialize in the production of goods and trade for mutual benefit<sup>15</sup> I conceptualize teamwork as workers “trading tasks.” Social skills increase productivity because they reduce the cost of trading tasks with other workers.<sup>16</sup> Workers with high social skills earn higher wages because they can specialize in their most productive tasks and trade their output with others. I develop a number of other predictions from this simple model—including the prediction that cognitive skills and social skills are complements—and find strong support for them in the data.

Defining social skills has important

real-world implications. First, social skills are conceptually distinct from *sociability*. A high-pressure sales representative might be gregarious and talkative, but not particularly good at understanding colleagues and working with them. Second, workers with strong social skills are more responsive to changes in their comparative advantage when “trading tasks” with different sets of teammates. They are *flexible* and can adapt to changing circumstances. Teamwork often involves playing different roles in different settings. For example, I might specialize in statistical analysis when working with my senior colleagues, but in writing and motivation when working with my junior colleagues. More generally, effective teamwork requires a complex and context-dependent understanding of one’s team members and their likely responses to a wide range of scenarios. This is intuitive for most people, but it is very difficult to codify as a set of explicit instructions.

### Measuring Soft Skills

Many studies have found that soft skills are important predictors of earnings and other adult outcomes. Some studies also associate gains in long-run outcomes with gains in soft skills.<sup>17</sup> Yet the study of soft skills is hamstrung by poor measurement and lack of definitional clarity. Most often, inferences about soft skills are made indirectly. For example, a consistent pattern in early childhood interventions is that these programs have long-run impacts on adult outcomes such as educational attainment and earnings, despite “fade-out” of test score gains. This has led researchers to conclude—indirectly—that the causal mechanism might be soft skills.<sup>18</sup>

While no measure is perfect, cognitive skills are much better measured than soft skills in terms of both validity and reliability. One might conclude from this that the construct of cognitive skill is inherently more valid. However, this ignores the history of measurement. Psychologists—and

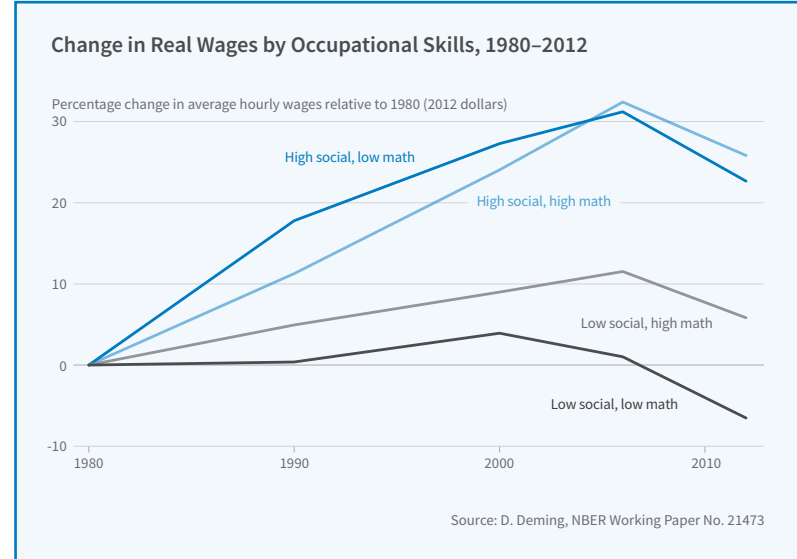


Figure 2

the testing industry—have spent several decades and millions of dollars systematically improving and refining the measurement of cognitive skills. The modern IQ test was created as a tool to diagnose intellectual delay, with lower scores simply indicating that children were unable to perform tasks that were “typical” for their same-age peers. Psychologists only later discovered that IQ test scores predict a variety of other outcomes such as grades, achievement test scores and earnings. By comparison, measurement of soft skills is in an embryonic stage.

The scholarly consensus about the importance of different human capacities is driven by how well these capacities can be measured. If we could develop reliable and context-invariant tests of important soft skills such as self-control and social intelligence, I would not be surprised if they ended up being equal or better predictors of labor market outcomes than IQ.

Soft skills are most often measured using survey questions that ask respondents to self-assess their personality characteristics. A prominent example is the Big 5 personality inventory, a rigorously developed psychological model that distills human personality into five factors—extraversion, conscientiousness, agreeableness, neuroticism, and openness to experience.<sup>19</sup> Big 5 personality measures—especially conscientiousness—are strongly positively correlated with educational attainment, labor market earnings, and other important life outcomes.<sup>20</sup>

However, self-assessments have a number of important problems that limit their usefulness for research and policy-making. First, they are highly context-dependent. Some recent evidence suggests that the cross-country correlation between conscientiousness and average hours worked is negative.<sup>21</sup> South Koreans report working nearly 2,500 hours per year, compared to around 1,500 hours for workers in France. Yet out of 26 countries, France places fourth and South Korea places 25th in self-reported conscientiousness.<sup>22</sup> Another recent study

finds that students who are randomly assigned to a set of schools known for their emphasis on character-building and hard work (so-called “no excuses” charter schools) self-report lower levels of conscientiousness, self-control, and “grit.”<sup>23</sup> In both cases, respondents are comparing themselves with those around them.<sup>24</sup>

Some recent research uses behavioral measures such as school absences or suspensions to measure soft skills.<sup>25</sup> These studies argue that behavioral measures are better because they are more predictive and less context-dependent. However, Shelly Lundberg shows that using school suspensions as a behavioral measure of impulsivity is problematic, since suspensions are also determined by school context, racial discrimination, and other unknown factors.<sup>26</sup> The deeper issue with using behaviors to measure soft skills is that sometimes behaviors are too predictive—they measure the underlying soft skill, but also many other things.<sup>27</sup>

Researchers ought to stop relying on convenient, off-the-shelf measures of soft skills and start creating metrics that are theoretically sound and suitable for the task at hand. I am as guilty as anyone else when it comes to using poor measures of soft skills. Here, economists may be able to learn from psychologists, who have carefully developed measures that map cleanly to underlying constructs but mostly have not subjected these measures to rigorous testing in a variety of field settings.

One possibly useful measure of social intelligence is the Reading the Mind in the Eyes Test (RMET), a measure of emotion recognition or social sensitivity.<sup>28</sup> The RMET was originally created to diagnose “theory of mind” deficits such as Asperger syndrome and high-functioning autism. However, much like IQ, psychologists have discovered that the RMET has predictive power for a wide variety of outcomes within a general population.

While the RMET is not perfect, it has two advantages relative to existing measures of soft skills. First, there are correct answers to the questions, which prevents reference group bias. Second, there is a well-grounded theory of how the underlying capacity (theory of mind) relates to task performance (emotion recognition in human faces). While there are many studies that probe the validity and reliability of the RMET across settings, I am not aware of any large-scale study that measures RMET performance in a broader population, and that addresses the correlation between social intelligence and measures of socioeconomic status such as income and parental education. There are many open questions to be answered. Does the RMET predict life outcomes at all? Is it differentially predictive for some groups? A research program that carefully builds out a mapping between theoretical constructs and measurement strategies for other soft skills such as creativity, self-control, and adaptability would be a foundational contribution.

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# International Linkages and the Business Cycle: Lessons from Micro for Macro

Andrei A. Levchenko

The international business cycle exhibits two prominent features. The first is significant positive comovement among countries. Figure 1 illustrates this by plotting the GDP growth rates for the G-7 countries. The tendency of GDP growth rates to move together is evident. Second, country pairs that are more closely linked through trade in goods and multinational production exhibit greater comovement. Figure 2 illustrates this with a scatterplot of the GDP correlation and the bilateral trade intensity for a sample of country pairs.

While the empirical literature has documented these relationships in the aggregate data, the reasons behind them are not well understood. There are two open questions. First, to what extent are these regularities due to transmission of shocks across countries, rather than simply correlated shocks? Second, what types of shocks—technology shocks or demand shocks—drive international comovement?

My collaborators and I take a fresh look at the international business cycle using recent insights from macroeconomics and newly available datasets. A central premise of our research program is that measuring and modeling shocks at the micro level (to firms and sectors) is essential for understanding the macro consequences of globalization. Our ultimate goal is to provide a unified perspective on business cycle comovement at the micro and aggregate levels.

## Transmission vs. Common Shocks

In our first project on this topic, Julian di Giovanni and I explore the trade-comovement relationship at the industry, rather than aggregate, level.<sup>1</sup> Industry-level data have two main advantages for studying comovement.

First, sector-country-pair panel data permit the inclusion of set country pair fixed effects to control for aggregate common shocks that plague the interpretation of estimates based on cross-country data. As a result, our approach provides much more robust evidence

on transmission of shocks.

Second, sector-level data permit a more precise measurement of input linkages. We use input-output matrices to gauge the intensity with which individual sectors use each other as sources of intermediate inputs in production. We then investigate whether input linkages across industries can help explain the impact of international trade on comovement. This provides evidence on transmission through a particular channel: the use of intermediate inputs in production.

Our main finding is that vertical linkages are an important driver of the trade-comovement relationship: Bilateral international trade increases comovement significantly more in cross-border industry pairs that use each other as sources of intermediate inputs. Our estimates imply that these vertical production linkages account for some 30 percent of the total impact of bilateral trade on the business cycle correlation.

Di Giovanni, Isabelle Méjean, and I then go to the firm level to better understand the role of international linkages in comovement.<sup>2</sup> We use data covering the universe of French firm-level value-added, destination-specific imports and exports, and cross-border ownership from 1993 through 2007. Observing cross-border links at the firm level allows us to establish with forensic precision the role of each type of trade and multinational relationship in cross-border comovement. In addition, because we have data on many firms selling to multiple countries, our estimation can include both firm and country effects. This allows us to show that trade and multinational linkages are indeed a source of transmission of shocks, rather than simply a stand-in for the presence of common shocks.

At the firm level, our main finding is that firms directly connected to foreign countries through trade or multinational linkages are more correlated with those countries, even after controlling for common shocks. At the macro level, we highlight the consequences of heterogeneity across firms in both size and the extent

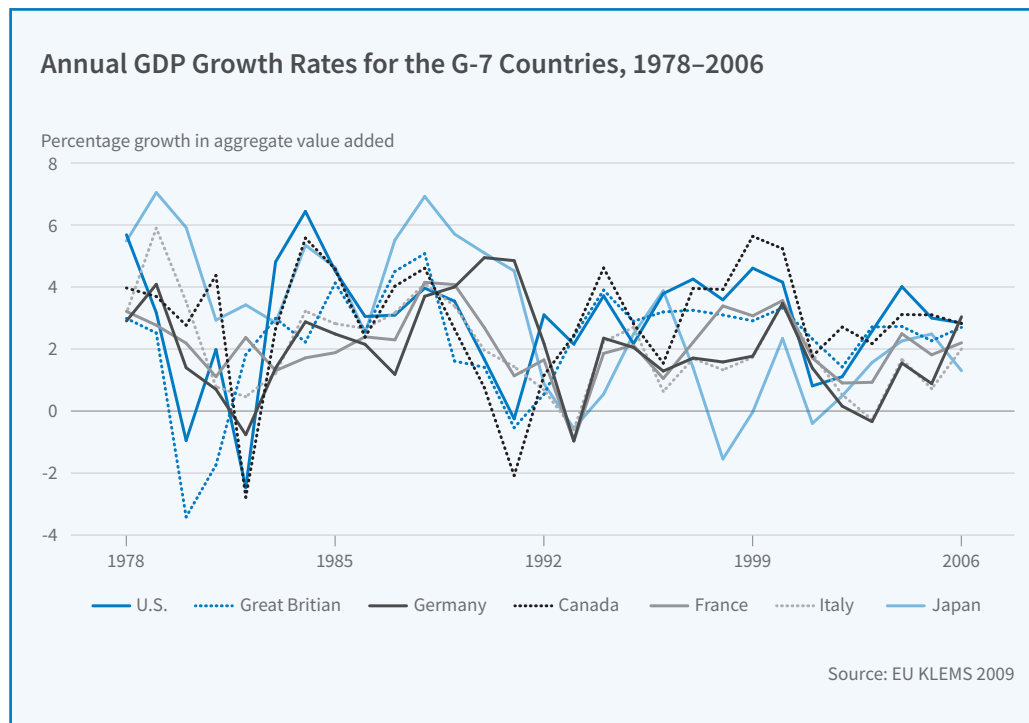


Figure 1

of international linkages. Larger firms are more likely to trade internationally and to own affiliates in foreign countries. Indeed, in most countries, international trade flows are dominated by a handful of large firms. It is a natural conjecture that these large, internationally connected firms matter for cross-border comovement. We compute the change in the aggregate correlation between France and each foreign country that would occur if direct linkages at the firm level disappeared. To do this, we combine the regression-based estimates of the change in the correlation at the firm level with firm-level weights. If direct linkages at the firm level were severed, the aggregate correlation would fall by 0.098 on average in our sample of ten partner countries. This is a non-negligible change relative to the average correlation between France and its main trading partners—0.291—over this period.

Javier Cravino and I focus on how multinational firms contribute to the transmission of shocks across countries.<sup>3</sup> We use Orbis, a firm-level database that covers several million firms operating in 34 countries over the period 2004–12. The key feature of the dataset is that it contains information on domestic and foreign ownership. This information allows us to study micro-level cross-country comovement between the different parts of multinational corporations. At the same time, the data cover

the bulk of economic activity in our sample of countries, making it possible to aggregate the firm-level results and derive their implications for aggregate comovement.

We document two novel empirical patterns. First, foreign affiliate and headquarters sales exhibit strong positive comovement: 10 percent growth in headquarters sales is associated with 2 percent growth in the sales of the affiliate. Second, shocks to the source country account for a significant fraction of the variation in sales growth at the source-destination level.

We propose a parsimonious quantitative model to interpret these findings and to evaluate the role of multinational firms for international business cycle transmission. For the typical country, foreign shocks transmitted by all foreign multinationals account for about 10 percent of aggregate productivity shocks. However, since bilateral multinational production shares are small, interdependence between most individual country pairs through this channel is minimal. Our results do reveal substantial heterogeneity in the strength of this mechanism, with the most integrated countries significantly more affected by foreign shocks.

While most work on the international business cycle focuses on comovement in quantities, we can gain additional insight by studying comovement in prices. Inflation rates are, if anything, even more synchronized across coun-

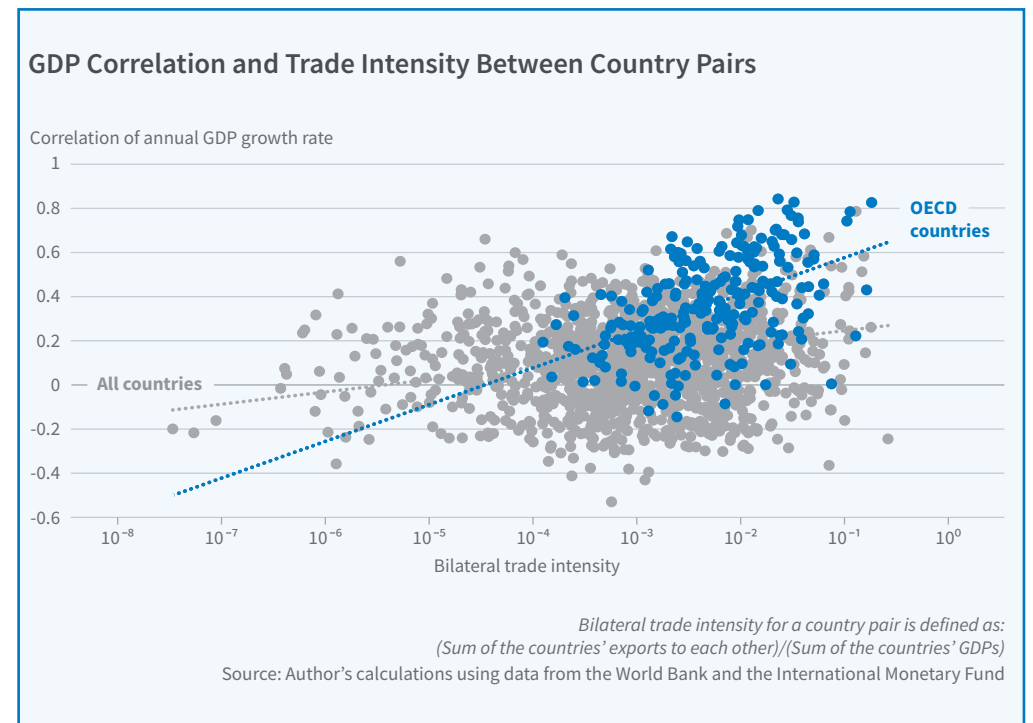


Figure 2

tries than GDP. The open question regarding inflation synchronization is the same as that for output synchronization: Is it driven by common shocks or by transmission of inflationary shocks across countries? Raphael Auer, Philip Sauré, and I investigate whether inflation synchronization is due to propagation of price shocks through input linkages.<sup>4</sup> We assemble a multi-country, industry-level dataset that combines information on monthly sector-level Producer Price Indices (PPI) and exchange rates with international and domestic input-output linkages.

We use these data to recover the cost shocks that are consistent with observed price dynamics and the global network of input-output trade. We then compare the extent of global synchronization in observed PPI and the recovered cost shock series, and attribute the difference to the impact of linkages. We find that input linkages contribute substantially to inflation synchronization across countries, accounting for about half of the global component of PPI inflation.

Building on the theme of transmission of price shocks, Cravino and I study a particularly important type of price shock: large exchange-rate changes.<sup>5</sup> Our main interest is gauging the distributional impact of large devaluations. The main insight combines two observations. First, devaluations lead to large changes in relative

prices. Second, consumers at different points on the income distribution have different consumption baskets. Poor households spend relatively more on tradable product categories, and consume lower-priced varieties within categories. Changes in the relative price of tradables and of lower-priced varieties will then affect the cost of living of low-income and high-income households differentially. We quantify these effects following the 1994 Mexican devaluation and show that they can have large distributional consequences. Two years post-devaluation, the cost of living for the bottom income decile rose 1.48 to 1.62 times more than for the top income decile. Thus, in the case we study, the devaluation was strongly anti-poor.

## TFP vs. Non-Technology Shocks

The second open question in the international business cycle literature is whether comovement is driven by total factor productivity (TFP) shocks or non-technology (sometimes called “demand”) shocks. The challenge is to separately identify and measure technology and non-technology shocks. Nitya Pandalai-Nayar and I propose a novel identification scheme for a non-technology business cycle shock, which we label “non-technology expectations” (NTE).<sup>6</sup> This is a shock that moves expectations of economic activity but



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Levchenko's research focuses on interactions among globalization, economic development, and macroeconomics. The main themes of his research have been the relationship between international trade and institutions, globalization and the business cycle, and quantitative assessments of the consequences of globalization.

Levchenko grew up in Moscow. He lives in Ann Arbor with his wife and three children.

is unrelated to productivity. We then estimate the international transmission of three identified shocks—surprise TFP, news of future TFP, and NTE—from the United States to Canada.

The U.S. non-technology shock produces a business cycle in the U.S., with output, hours, and consumption rising following a positive shock, and accounts for the bulk of U.S. short-run business cycle fluctuations. The non-technology shock also has a significant impact on Canadian macro aggregates. In the short run, it is more important than either the surprise TFP or the news of future TFP shocks in generating business cycle comovement between the U.S. and Canada, accounting for over 40 percent of the forecast error variance of Canadian GDP and over one-third of the variation in Canadian hours, imports, and exports.

Next, we extend the analysis to multiple countries and sectors.<sup>7</sup> Using industry-level data on 30 countries over up to 28 years, we develop estimates of utilization-adjusted TFP shocks, and an approach to infer non-technology shocks. We then set up a quantitative model calibrated to the observed international input-output and final-goods trade data, and use it to assess the contribution of both technology and non-technology shocks to international comovement. We show that unlike the traditional Solow residual, the utilization-adjusted TFP shocks are virtually uncorrelated across countries. Transmission of TFP shocks across countries also cannot generate noticeable comovement in GDP in our sample of countries. By contrast, non-technology shocks are highly correlated across countries, and the model simulation with only non-technology shocks generates substantial GDP correlations.

### Taking Stock

What have we learned from this research program? First, firm- and sector-level data are the right place to measure transmission of shocks across countries. In the micro data, evidence of transmission is pervasive. Whether transmission estimated at the micro level leads to substantial comovement in the macro aggregates is somewhat less certain, and depends on the details of how shocks are propagated and on the general equilibrium mechanisms.

Second, non-technology shocks are much more important for international comovement

than technology shocks, both because they are transmitted across countries to a greater extent, and because they are more correlated across countries than TFP shocks. Our main takeaway is that in order to understand international comovement, it is essential to both model and measure non-TFP shocks.

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<sup>6</sup> A. Levchenko and N. Pandalai-Nayar, "TFP, News, and 'Sentiments': The International Transmission of Business Cycles," *NBER Working Paper No. 21010*, March 2015.  
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<sup>7</sup> A. Levchenko and N. Pandalai-Nayar, "Technology and Non-Technology Shocks: Measurement and Implications for International Comovement," *mimeo*, University of Michigan and University of Texas, November 2017.  
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## New Evidence on the Impacts of Birth Order

**Sandra E. Black**

What determines a child's success? We know that family matters—children from higher socioeconomic status families do better in school, get more education, and earn more.

However, even beyond that, there is substantial variation in success across children within families. This has led researchers to study factors that relate to within-family differences in children's outcomes. One that has attracted much interest is the role played by birth order, which varies systematically within families and is exogenously determined.

While economists have been interested in understanding human capital development for many decades, compelling economic research on birth order is more recent and has largely resulted from improved availability of data. Early work on birth order was hindered by the stringent data requirements necessary to convincingly identify the effects of birth order. Most importantly, one needs information on both family size and birth order. As there is only a third-born child in a family with at least three children, comparing third-borns to firstborns across families of different sizes will conflate the birth order effect with a family size effect, so one needs to be able to control for family size. Additionally, it is beneficial to have information on multiple children from the same family so that birth order effects can be estimated from within-family differences in child outcomes; otherwise, birth order effects will be conflated with other effects that vary systematically with birth order, such as cohort effects. Large Scandinavian register datasets that became available to researchers beginning in the late 1990s have enabled birth order research, as they contain population data on both family structure and a variety of child outcomes. Here, I describe my research with a number of coauthors, using these data to explore the effects of birth order on outcomes including human capital accumulation, earnings, development of cognitive and non-cognitive skills, and health.

### Birth Order and Economic Success

Almost a half-century ago, economists including Gary Becker, H. Gregg Lewis, and Nigel Tomes created models of quality-quantity trade-offs in child-rearing and used these models to explore the role of family in children's success. They sought to explain an observed negative correlation between family income and family size: if child quality is a normal good, as income rises the family demands higher-quality children at the cost of lower family size.<sup>1</sup>

However, this was a difficult model to test, as characteristics other than family income and child quality vary with family size. The introduction of natural experiments, combined with newly available large administrative datasets from Scandinavia, made testing such a model possible.

In my earliest work on the topic, Paul Devereux, Kjell Salvanes, and I took advantage of the Norwegian administrative dataset and set out to better understand this theoretical quantity-quality tradeoff.<sup>2</sup> It became clear that child "quality" was not a constant within a family—children within families were quite different, despite the model assumptions to the contrary. Indeed, we found that birth order could explain a large fraction of the family size differential in children's educational outcomes. Average educational attainment was lower in larger families largely because later-born children had lower average education, rather than because firstborns had lower education in large families than in small families. We found that firstborns had higher educational attainment than second-borns who in turn did better than third-borns, and so on. These results were robust to a variety of specifications; most importantly, we could compare outcomes of children within the same families.

To give a sense of the magnitude of these effects: The difference in educational attainment between the first child and the fifth child in a five-child family is roughly equal to the difference between the educational



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Black served as a member of President Obama's Council of Economic Advisers, August 2015–January 2017. Prior to arriving at the University of Texas, she was an economist at the Federal Reserve Bank of New York and a professor in the Department of Economics at UCLA. She was a co-editor of *The Journal of Human Resources*, 2005–12, and editor-in-chief from 2012–15. She has been elected a fellow of the Society of Labor Economists, is an affiliated faculty member at the Norwegian School of Economics, and in January will become a member of the board of the Committee on the Status of Women in the Economics Profession.

Black's research focuses on the effects of early life experiences on the long-run outcomes of children, and on issues of gender and discrimination. She was born and raised in Los Angeles and received her B.A. from the University of California, Berkeley and her Ph.D. in economics from Harvard University. She lives in Austin with her husband.



attainment of blacks and whites calculated from the 2000 Census. We augmented the education results by examining earnings, whether full-time employed, and whether one had a child as a teenager as additional outcome variables, and found strong evidence for birth order effects, particularly for women. Later-born women have lower earnings (whether employed full-time or not), are less likely to work full-time, and are more likely to have their first child as teenagers. In contrast, while later-born men have lower full-time earnings, they are not less likely to work full-time [Figure 1].

### Birth Order and Cognitive Skills

One possible explanation for these differences is that cognitive ability varies systematically by birth order. In subsequent work, Devereux, Salvanes, and I examined the effect of birth order on IQ scores.<sup>3</sup>

The psychology literature has long debated the role of birth order in determining children's IQs; this debate was seemingly resolved when, in 2000, J. L. Rodgers et al. published a paper in *American Psychologist* entitled "Resolving the Debate Over Birth Order, Family Size, and Intelligence" that referred to the apparent relationship between birth order and IQ as a "methodological illusion."<sup>4</sup> However, this work was limited due to the absence of large representative datasets

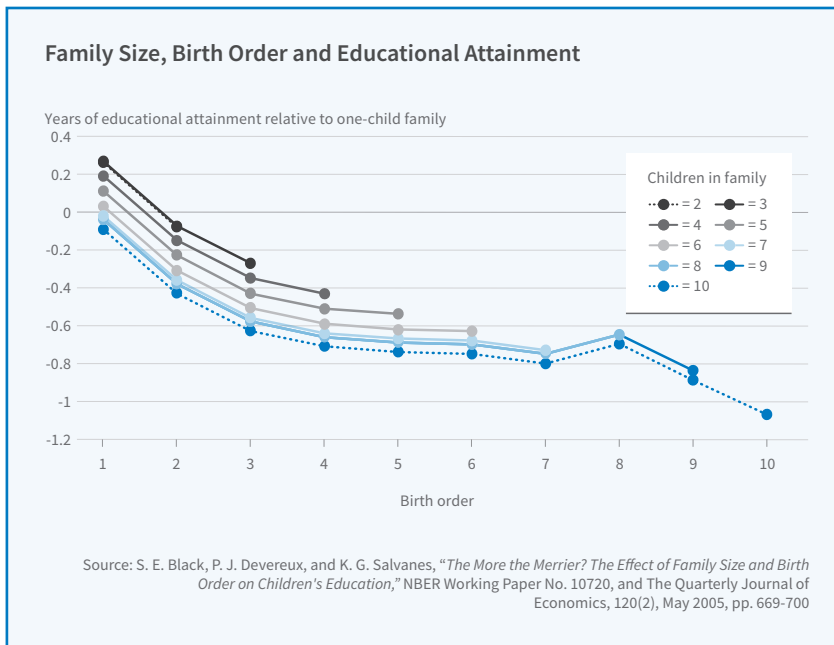


Figure 1

necessary to identify these effects. We again used population register data from Norway to estimate this relationship.

To measure IQ, we used the outcomes of standardized cognitive tests administered to Norwegian men between the age of 18 and 20 when they enlist in the military. Consistent with our earlier findings on educational attainment but in contrast to the previous work in the literature, we found strong birth order effects

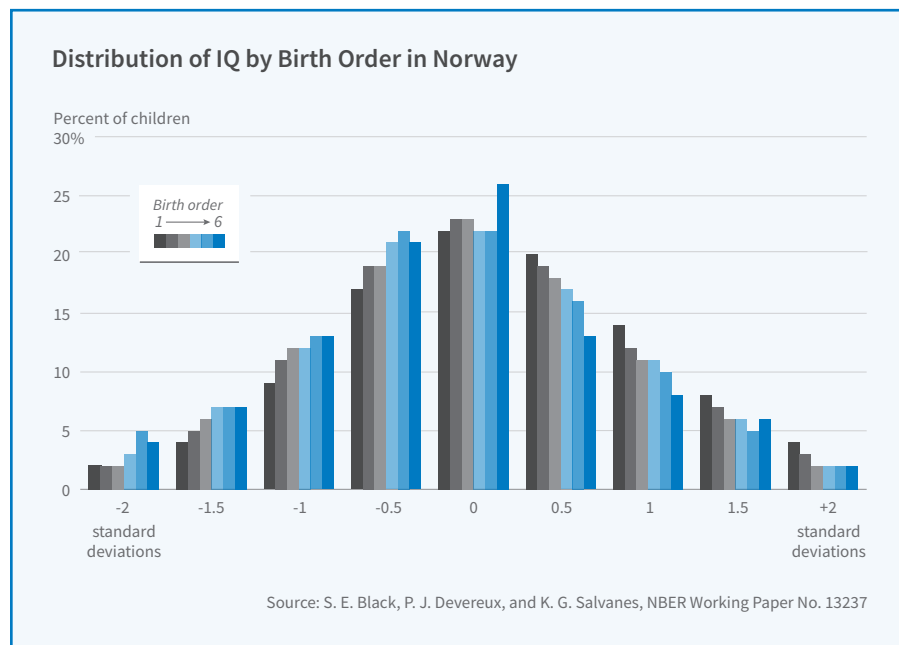


Figure 2

on IQ that are present when we look within families. Later-born children have lower IQs, on average, and these differences are quite large. For example, the difference between firstborn and second-born average IQ is on the order of one-fifth of a standard deviation, or about three IQ points. This translates into approximately a 2 percent difference in annual earnings in adulthood.

### The Effect of Birth Order on Non-Cognitive Skills

Personality is another factor that is posited to vary by birth order, a proposition that has been particularly difficult to assess in a compelling way due to the paucity of large datasets containing information on individual personality. In recent work on the topic, Erik Gronqvist, Bjorn Ockert, and I use Swedish administrative datasets to examine this issue.<sup>5</sup>

In the economics literature, personality traits are often referred to as non-cognitive abilities and denote traits that can be distinguished from intelligence.<sup>6</sup> To measure "personality" (or non-cognitive skills), we use the outcome of a standardized psychological evaluation, conducted by a certified psychologist, that is performed on all Swedish men between the ages of 18 and 20 when they enlist in the military, and which is strongly related to success in the labor market. An individual is given a higher score if he is considered to be emotionally stable,

persistent, socially outgoing, willing to assume responsibility, and able to take initiative. Similar to the results for cognitive skills, we find evidence of consistently lower scores in this measure for later-born children. Third-born children have non-cognitive abilities that are 0.2 standard deviations below firstborn children. Interestingly, boys with older brothers suffer almost twice as much in terms of these personality characteristics as boys with older sisters.

Importantly, we also demonstrate that these personality differences translate into differences in occupation choice by birth order. Firstborn children are significantly more likely to be employed and to work as top managers, while later-born children are more likely to be self-employed. More generally, firstborn children are more likely to be in occupations requiring sociability, leadership ability, conscientiousness, agreeableness, emotional stability, extraversion, and openness.

### The Effect of Birth Order on Health

Finally, how do these differences translate into later health? In more recent work, Devereux, Salvanes, and I analyze the effect of birth order on health.<sup>7</sup> There is a sizable body of literature about the relationship between birth order and adult health; individual studies have typically examined only one or a small number of health outcomes and, in many cases, have used relatively small samples. Again, we use large nationally representative data from Norway to identify the relationship between birth order and health when individuals are in their 40s, where health is measured along a number of dimensions, including medical indicators, health behaviors, and overall life satisfaction.

The effects of birth order on health are less straightforward than other outcomes we have examined, as firstborns do better on some dimensions and worse on others. We find that the probability of having high blood pressure declines with birth order, and the largest gap is between first- and second-borns. Second-borns are about 3 percent less

likely to have high blood pressure than firstborns; fifth-borns are about 7 percent less likely to have high blood pressure than firstborns. Given that 24 percent of this population has high blood pressure, this is quite a large difference. Firstborns are also more likely to be overweight and obese. Compared with second-borns, firstborns are 4 percent more likely to be overweight and 2 percent more likely to be obese. The equivalent differences between fifth-borns and firstborns are 10 percent and 5 percent. For context, 47 percent of the population is overweight and 10 percent is obese. Once again, the magnitudes are quite large.

However, later-borns are less likely to consider themselves to be in good health, and measures of mental health generally decline with birth order. Later-born children also exhibit worse health behaviors. The number of cigarettes smoked daily increases monotonically with birth order, suggesting that the higher prevalence of smoking by later-borns found among U.S. adolescents by Laura M. Argys et al.<sup>8</sup> may persist throughout adulthood and, hence, have important effects on health outcomes.

### Possible Mechanisms

Why are adult outcomes likely to be affected by birth order? A host of potential explanations has been proposed across several academic disciplines.

A number of biological factors may explain birth order effects. These relate to changes in the womb environment or maternal immune system that occur over successive births. Beyond biology, parents could have other influences. Childhood inputs, especially in the first years of life, are considered crucial for skill formation.<sup>9</sup> Firstborn children have the full attention of parents, but as families grow the family environment is diluted and parental resources become scarcer.<sup>10</sup> In contrast, parents are more experienced and tend to have higher incomes when raising later-born children. In addition, for a given amount of resources, parents may treat firstborn children differently than second- or later-born children. Parents may

use more strict parenting practices toward the firstborn, so as to gain a reputation for "toughness" necessary to induce good behavior among later-borns.<sup>11</sup>

There are also theories that suggest that interactions among siblings can shape birth order effects. For example, based on evolutionary psychology, Frank J. Sulloway suggests that firstborns have an advantage in following the status quo, while later-borns—by having incentives to engage in investments aimed at differentiating themselves—become more sociable and unconventional in order to attract parental resources.<sup>12</sup>

In each of these papers, we attempted to identify potential mechanisms for the patterns we observed. However, it is here we see the limitations of these large administrative datasets, as for the most part, we lack necessary detailed information on biological factors and on household dynamics when the children are young. However, we do have some evidence on the role of biological factors. Later-born children tend to have better birth outcomes as measured by factors such as birth weight. In our Swedish data, we took advantage of the fact that some children's biological birth order is different from their environmental birth order, due to the death of an older sibling or because their parent gave up a child for adoption. When we examine this subsample, we find that the birth order effect on occupational choice is entirely driven by the environmental birth order, again suggesting that biological factors may not be central.

Also in our Swedish study, we found that firstborn teenagers are more likely to read books, spend more time on homework, and spend less time watching TV or playing video games. Parents spend less time discussing school work with later-born children, suggesting there may be differences in parental time investments. Using Norwegian data, we found that smoking early in pregnancy is more prevalent for first pregnancies than for later ones. However, women are more likely to quit smoking during their first pregnancy than during later ones, and firstborns are more likely to be breastfed. These findings suggest that early investments may

systematically benefit firstborns and help explain their generally better outcomes.

## Conclusion

In the past two decades, with the increased accessibility of administrative datasets on large swaths of the population, economists and other researchers have been better able to identify the role of birth order in the outcomes of children. There is strong evidence of substantial differences by birth order across a range of outcomes. While I have described several of my own papers on the topic, a number of other researchers have also taken advantage of newly available datasets in Florida and Denmark to examine the role of birth order on other important outcomes, specifically juvenile delinquency and later criminal behavior.<sup>13</sup> Consistent with the work discussed here, later-born children experience higher rates of delinquency and criminal behavior; this is at least partly attributable to time investments of parents.

<sup>1</sup> G. Becker, "An Economic Analysis of Fertility," in *Demographic and Economic Change in Developed Countries*, New York, Columbia University Press, 1960, pp. 209–40; G. Becker and H. Lewis, "Interaction Between Quantity and Quality of Children," in *Economics of the Family: Marriage, Children, and Human Capital*, 1974, pp. 81–90; G. Becker and N. Tomes, "Child Endowments, and the Quantity and Quality of Children," NBER Working Paper No. 123, February 1976.

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<sup>2</sup> S. Black, P. Devereux, and K. Salvanes, "The More the Merrier? The Effect of Family Composition on Children's Education" NBER Working Paper No. 10720, September 2004, and *Quarterly Journal of Economics*, 120(2), 2005, pp. 669–700.

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<sup>4</sup> J. Rodgers, H. Cleveland, E. van den Oord, and D. Rowe, "Resolving the Debate Over Birth Order, Family Size, and Intelligence," *American Psychologist*, 55(6), 2000, pp. 599–612.

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<sup>6</sup> L. Borghans, A. Duckworth, J. Heckman, and B. ter Weel, "The Economics and Psychology of Personality Traits," *Journal of Human Resources*, 43, 2008, pp. 972–1059.

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<sup>7</sup> S. Black, P. Devereux, K. Salvanes, "Healthy (?), Wealthy, and Wise: Birth Order and Adult Health," NBER Working Paper No. 21337, July 2015.

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<sup>8</sup> L. Argys, D. Rees, S. Averett, and B. Witoonchart, "Birth Order and Risky

Adolescent Behavior," *Economic Inquiry*, 44(2), 2006, pp. 215–33.

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<sup>9</sup> F. Cunha and J. Heckman, "The Technology of Skill Formation," NBER Working Paper No. 12840, January 2007.

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<sup>10</sup> R. Zajonc and G. Markus, "Birth Order and Intellectual Development," *Psychological Review*, 82(1), 1975, pp. 74–88; R. Zajonc, "Family Configuration and Intelligence," *Science*, 192(4236), 1976, pp. 227–36; J. Price, "Parent-Child Quality Time: Does Birth Order Matter?" in *Journal of Human Resources*, 43(1), 2008, pp. 240–65; J. Lehmann, A. Nuevo-Chiquero, and M. Vidal-Fernandez, "The Early Origins of Birth Order Differences in Children's Outcomes and Parental Behavior," forthcoming in *Journal of Human Resources*.

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<sup>11</sup> V. Hotz and J. Pantano, "Strategic Parenting, Birth Order, and School Performance," NBER Working Paper No. 19542, October 2013, and *Journal of Population Economics*, 28(4), 2015, pp. 911–936.

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<sup>12</sup> F. Sulloway, *Born to Rebel: Birth Order, Family Dynamics, and Creative Lives*, New York, Pantheon Books, 1996.

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<sup>13</sup> S. Breining, J. Doyle, D. Figlio, K. Karbownik, J. Roth, "Birth Order and Delinquency: Evidence from Denmark and Florida," NBER Working Paper No. 23038, January 2017.

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Karabarounis's research interests are in macroeconomics, labor economics, and international finance. His latest research focuses on topics such as the global decline in labor's share of income, productivity and capital flows in southern Europe, cyclical and dispersion in labor market outcomes, and the effects of unemployment insurance policy on macroeconomic outcomes. He is a recipient of the 2016 Sloan Research Fellowship, awarded by the Alfred P. Sloan Foundation. He received his Ph.D. in Economics from Harvard University and an undergraduate degree from the Athens University of Economics and Business.

## Trends in Factor Shares: Facts and Implications

Loukas Karabarounis and Brent Neiman

The distribution of national income between capital and labor and the determinants of that split are important for many reasons. The evolution of factor shares over time affects income inequality across households. Changes in factor shares inform economists' assumptions about aggregate production technologies and their understanding of the state of product and labor markets. The behavior of factor shares influences conclusions about the implications of progress in computing, robotics, and information technologies, the response and incidence of changes in tax policies, and the dynamics of markups and competition.

For many decades, the assumed stability of factor shares — one of the "stylized facts" about growth codified by Nicholas Kaldor in 1961 — meant that the modern macroeconomics literature paid little attention to trends in the functional distribution of income.<sup>1</sup> Measurement challenges and the absence of long time series for more than a small set of countries likely also played a role in dampening economists' interest in the evolution of factor shares over time.<sup>2</sup>

### The Global Decline of the Labor Share

Our work builds on a dataset that we collected from national income and product accounts for many countries and industries. We demonstrate that, at the global level, the labor share has been declining since the early 1980s.<sup>3</sup> The decline has been broad-based. As shown in Figure 1, it occurred in seven of the eight largest economies of the world. It occurred in all Scandinavian countries, where labor unions have traditionally been strong. It occurred in emerging markets such as China, India, and Mexico that have opened up to international trade and received outsourcing from developed countries such as the United States.

Where available, we use the labor share of income in the corporate sector as our preferred measure of the labor share, as it excludes many unincorporated enterprises and sole proprietors whose income is difficult to split between labor and capital. Further, our measure is not influenced by the government sector, which lacks market

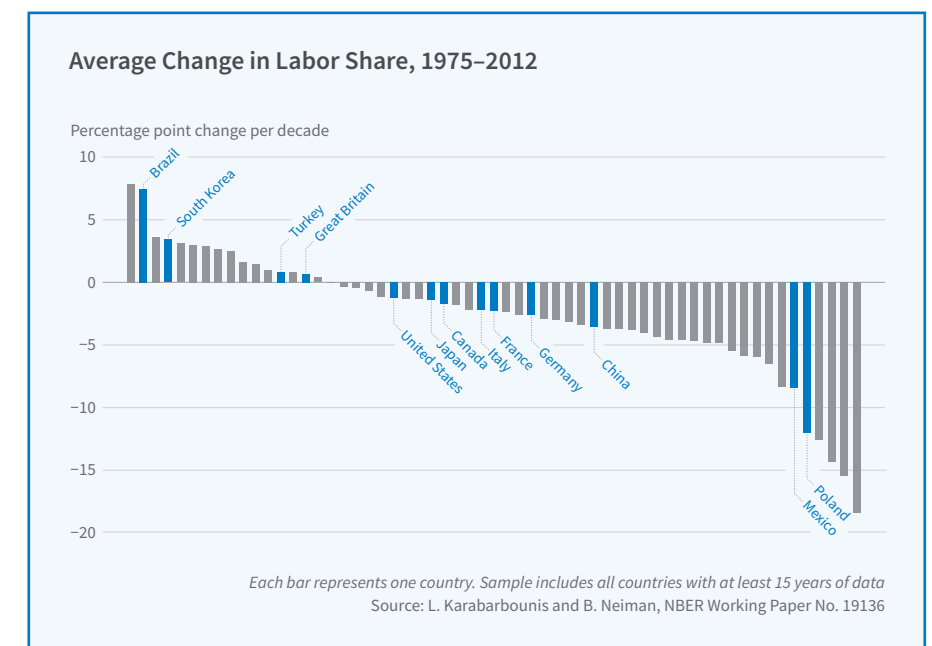


Figure 1



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Neiman conducts research on international macroeconomics, finance, and trade. He previously served on the White House Council of Economic Advisers as a staff economist for international finance and has worked at the Federal Reserve Bank of Chicago, McKinsey & Company, and the McKinsey Global Institute.

In 2014, Neiman was one of the eight economics professors in the United States and Canada to receive the Sloan Research Fellowship, an award given to early-career scientists. In 2009, he was named as one of 22 "Emerging Leaders" by the Chicago Council of Global Affairs.

Neiman earned a Bachelor of Science in Economics and a Bachelor of Applied Science, both *summa cum laude*, from the University of Pennsylvania in 1999. In 2000, he earned a master's degree in mathematical modeling from Oxford University, where he studied as a Thouron fellow, and he earned a Ph.D. in economics from Harvard University in 2008. He joined the Chicago Booth faculty in 2008.

Outside the classroom, Neiman is an enthusiastic golfer and was a bench warmer on the 1998 Ivy League Champion golf team as an undergraduate. He also enjoys travel and is always up for dim sum.

prices for its output, or by the residential sector (that has a labor share of zero), whose share of the total GDP fluctuates for reasons potentially unrelated to technology or product market structure.<sup>4</sup> We have posted our country-level data set online and it has been used in a number of studies.

The labor share declines occurred in most U.S. states and, globally, in most industries, including manufacturing, wholesale, and retail. Some have suggested that the share of compensation in domestic product net of depreciation, rather than in gross domestic product, is more informative about inequality between workers and capitalists. In fact, while some exceptions exist, most notably the United States, most countries experienced similar trend declines in their labor shares regardless of whether the share is measured as a fraction of net or gross domestic product.<sup>5</sup>

### Possible Explanations

The labor share decline likely has multiple drivers. A key benefit of our focus on the global decline is that it restricts the set of explanations to those that operate on a global scale. Country-specific changes in policies,

for instance, might be important for specific countries but are unlikely to account for much of the overall trend that the world has experienced.

Global trends in the value-added shares of various industries, referred to as structural change, contribute to the decline in the labor share if industries with lower labor share levels have grown relative to industries with higher labor share levels. Most of the labor share decline—and most of the cross-country variation in the labor share decline—is due to within-industry declines.

Another possible force contributing to the decline in the labor share is the substitution away from labor and toward capital in production. There was a decline in the price of investment relative to consumption that accelerated globally around the same time that the global labor share began its decline. A key hypothesis that we put forward is that the decline in the relative price of investment, often attributed to advances in information technology, automation, and the computer age, caused a decline in the cost of capital and induced firms to produce with greater capital intensity. If the elasticity of substitution between capital and labor—the percentage change in the

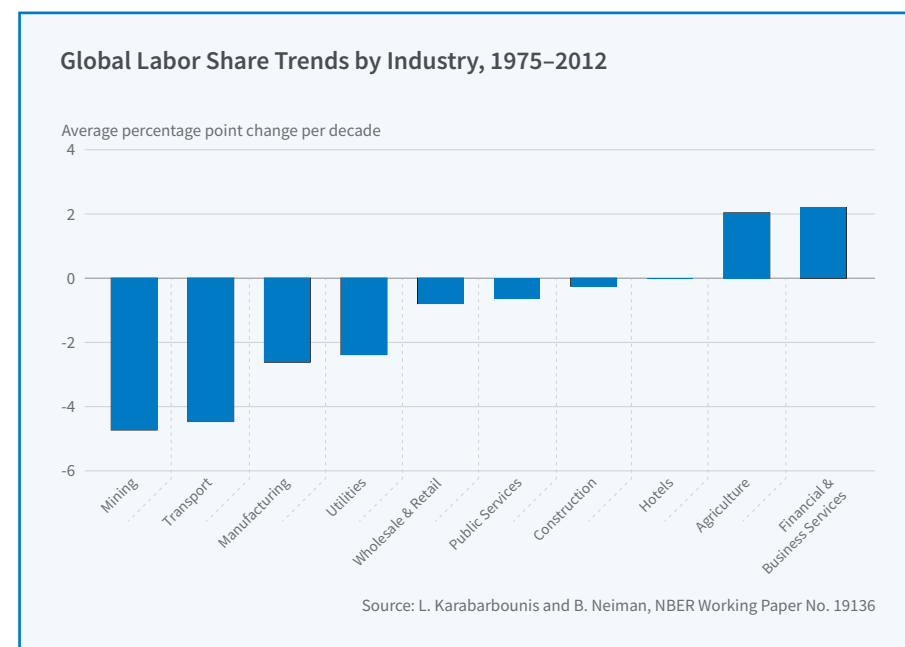


Figure 2

capital-labor ratio in response to a percentage change in the relative cost of labor and capital—is greater than one, the lowering of the cost of capital results in a decline in the labor share.

Most prior estimates of the elasticity of substitution between capital and labor are based on time series variation within a country in factor shares and factor prices. These estimates generally imply an elasticity of substitution below one. By contrast, our estimates of this elasticity are identified from cross-country and cross-industry variation in trends in labor shares and investment price declines. We find that countries and industries with larger declines in investment prices experienced larger declines in their labor shares, which leads to our estimate of an elasticity of substitution equal to 1.25. Taken together with the observed decline in the relative price of investment, our estimates imply that this form of technological change accounts for roughly half of the decline in the global labor share.<sup>6</sup>

This elasticity—and the implied relationship between capital-biased technical change and the labor share—applies at the industry or country level and is therefore inclusive of changes in economic activity across firms within industries or across firms and industries within countries. Our hypothesis that progress with IT-related technologies has contributed to the decline in the labor share is, therefore, not inconsistent with the possibility that most firms experience stable or even rising labor shares, while low labor share firms gained in market share.<sup>7</sup>

We also demonstrate how the inclusion of multiple types of capital with heterogeneous depreciation rates complicates the relationship between labor shares and the user cost of capital. Further, while a single elasticity suffices to relate trends in the labor share to trends in the user cost of capital when all capital can be bundled into a single type, this will not be the case for production functions with different nesting of capital types and labor, such as those posited in the literature on capital-skill complementarity.<sup>8</sup> Our continuing work aims to further explore these issues.

If technology explains half of the global labor share decline, what might

explain the other half? We use investment flows data to separate residual payments into payments to capital and economic profits, and find that the capital share did not rise as it should if capital-labor substitution entirely accounted for the decline in the labor share. Rather, we note that increases in markups and the share of economic profits also played an important role in the labor share decline.<sup>9</sup>

### Other Implications

Beyond the conclusions about technology and product market structure that emerge, why else does the labor share decline matter? The evolution of the labor share is a useful summary statistic for consumption or welfare-based inequality between a representative worker and capitalist. Some analyses focus on the labor share in gross domestic product

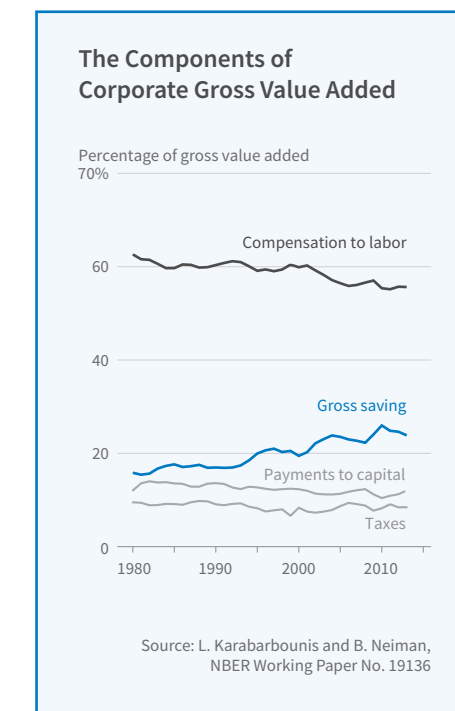


Figure 3

while others emphasize the labor share in net domestic product. Which of the two measures best approximates inequality depends on whether one studies transitional dynamics or the steady state, as well as which shocks are driving the labor share decline.

Our work also uncovers a closely

related trend influencing the financing of global investment.<sup>10</sup> Whereas in 1980 household saving funded most global investment, today corporate saving accounts for nearly two-thirds of every invested dollar. We measure corporate saving as undistributed corporate profits, which together with household and government saving equal national saving. We use a combination of aggregate and firm-level data to demonstrate that the decline in the global labor share resulted in an increase in accounting profits. Since dividends did not keep pace with profits, corporate saving increased.

The increase in corporate saving was also pervasive at the global level and observed in all ten of the largest economies. Further, given that global corporate investment has been relatively stable as a share of GDP since 1980, the corporate sector evolved from a net borrower to a net lender to the rest of the economy. The improvement in the net lending position of the corporate sector fell into various margins of adjustment, including reductions in debt, accumulation of cash, and equity buybacks.

### Next Steps

The stability of the labor share of income is a key assumption built into most modern macroeconomic models, but recent evidence shows downward trends in the labor share in the majority of countries and industries. Such trends are informative for the design of macroeconomic models, for evaluating changes in corporate financial practices, for assessing inequality, and for designing monetary and fiscal policies. A consensus remains elusive on the exact roles of factors such as technology, product market competition, globalization, and housing, and we are continuing our exploration of these issues in U.S. and international data.

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<sup>2</sup> In thinking about the cross-section, for example, D. Gollin, “Getting Income Shares Right,” Journal of Political Economy, 110(2), 2002, pp. 458–74, stressed the pitfalls in studying labor shares without a careful accounting for the mixed income earned by proprietors and unincorporated businesses. By the late 1990s or early 2000s, few countries had long and consistent time series that allowed for our preferred treatment of this income.

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<sup>3</sup> L. Karabarbounis and B. Neiman, “The Global Decline of the Labor Share,” NBER Working Paper No. 19136, October 2013, and The Quarterly Journal of Economics, 129(1), February 2014, pp. 61–103.

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<sup>4</sup> While we view it as an improvement in this regard over the total labor share, see M. Smith, D. Yagan, O. Zidar, and E. Zwick, “Capitalists in the Twenty-First Century,” Working Paper, 2017, for

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<sup>5</sup> See L. Karabarbounis and B. Neiman, “Capital Depreciation and Labor Shares Around the World: Measurement and Implications,” NBER Working Paper No. 20606, November 2014, and B. Bridgman, “Is Labor’s Loss Capital’s Gain? Gross Versus Net Labor Shares,” Macroeconomic Dynamics, July 2017.

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<sup>7</sup> This pattern can be found in several firm or plant-level analyses of U.S. data, including D. Autor, D. Dorn, L. Katz, C. Patterson, and J. Van Reenen, “Concentrating on the Fall of the Labor Share,” NBER Working Paper No. 23108, January 2017, and American Economic Review Papers & Proceedings, 107(5), May 2017, pp. 180–5; B. Hartman-Glaser, H. Lustig, and M. Zhang, “Capital Share Dynamics When Firms Insure Workers,” NBER Working Paper No. 22651, October

2017; M. Kebrig and N. Vincent, “Growing Productivity Without Growing Wages: The Micro-Level Anatomy of the Aggregate Labor Share Decline,” Working Paper, 2017.

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<sup>8</sup> See P. Krusell, L. Ohanian, J.-V. Rios-Rull and G. Violante, “Capital-Skill Complementarity and Inequality: A Macroeconomic Analysis,” Econometrica, 68(5), September 2000, pp. 1029–53.

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<sup>9</sup> See M. Rognlie, “Deciphering the Fall and Rise in the Net Capital Share: Accumulation, or Scarcity?,” Brookings Papers on Economic Activity, 46(1), spring 2015, pp. 1–69; S. Barkai, “Declining Labor and Capital Shares,” Working Paper, 2017; and J. De Loecker and J. Eeckhout, “The Rise of Market Power and the Macroeconomic Implications,” NBER Working Paper No. 23687, August 2017, for work elaborating on this rise in economic profits as it relates to the labor share.

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<sup>10</sup> See P. Chen, L. Karabarbounis, and B. Neiman, “The Global Rise of Corporate Saving,” NBER Working Paper No. 23133, March 2017, and Journal of Monetary Economics, 89, August 2017, pp. 1–19.

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## NBER News

### Richard Thaler Awarded Nobel for Research on Behavioral Economics

Richard Thaler of the University of Chicago’s Booth School of Business, an NBER research associate for more than 25 years, was awarded the 2017 Nobel Prize in Economic Sciences for his research in behavioral economics. The award was announced in October, and Thaler delivered his prize lecture, “From Cashews to Nudges: The Evolution of Behavioral Economics,” on December 8 in Stockholm.

[\[Lecture slides\]](#)

The Royal Swedish Academy of Sciences’ announcement of the prize explains that Thaler “has incorporated psychologically realistic assumptions into analyses of economic decision-making. By exploring the consequences of limited rationality, social preferences, and lack of self-control, he has shown how these human traits systematically affect individual decisions as well as market outcomes.

“His empirical findings and theoretical insights have been instrumental in creating the new and rapidly expanding field of behavioral economics, which has had a profound impact on many areas of economic research and policy.”

The Academy cited many settings in which behavioral insights have enriched the research dialogue, includ-



ing the study of household saving, the formation of prices in financial markets, the role of fairness in setting wages and prices, and the potential for “nudges” to influence consumer behavior. The Academy’s description of the ways in which Thaler’s work has been applied may be found [here](#).

A longer summary of the scientific contributions that underlie this award may be found [here](#).

Thaler is the Charles R. Walgreen Distinguished Service Professor of Economics and Behavioral Science at the Booth School and a research

associate in the NBER’s Asset Pricing Program. In 1992, he and Robert Shiller launched the NBER Working Group on Behavioral Economics, which has served as an important forum for researchers in this field. He served as co-director of the group until 2016.

Thaler became the 27th current or past NBER research affiliate to receive the Nobel Prize:

Oliver Hart and Bengt Holmström, 2016; Angus Deaton, 2015; Lars Hansen and Robert Shiller, 2013; Alvin Roth, 2012; Thomas Sargent and Christopher Sims, 2011; Peter Diamond, 2010; Paul Krugman, 2008; Edward C. Prescott and Finn Kydland, 2004; Robert F. Engle, 2003; Joseph E. Stiglitz, 2001; James J. Heckman and Daniel L. McFadden, 2000; Robert C. Merton and Myron S. Scholes, 1997; Robert E. Lucas, Jr., 1995; and the late: Dale Mortensen, 2010; Robert W. Fogel, 1993; Gary S. Becker, 1992; George J. Stigler, 1982; Theodore W. Schultz, 1979; Milton Friedman, 1976; and Simon Kuznets, 1971.

In addition, six current or past members of the NBER Board of Directors have received the Nobel Prize: George Akerlof, 2001; Robert Solow, 1987; and the late: William Vickrey, 1996; Douglass North, 1993; James Tobin, 1981; and Paul Samuelson, 1970.

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## Conferences

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### Financial Market Regulation

A conference on financial market regulation sponsored by the Puelicher Center for Banking Education at the University of Wisconsin took place in Cambridge on October 6. Research Associates Dean Corbae of the University of Wisconsin and Robert Townsend of MIT organized the meeting. These researchers' papers were presented and discussed:

- **Greg Buchak**, University of Chicago; **Gregor Matvos**, University of Texas at Austin and NBER; **Tomasz Piskorski**, Columbia University and NBER; and **Amit Seru**, Stanford University and NBER, "Fintech, Regulatory Arbitrage, and the Rise of Shadow Banks" (NBER Working Paper No. 23288)
- **Andrea L. Eisfeldt**, University of California at Los Angeles and NBER; **Bernard Herskovic**, University of California, Los Angeles; **Sriram Rajan**, U.S. Department of the Treasury; and **Emil Siriwardane**, Harvard University, "Risk Reallocation in OTC Derivatives Networks"
- **Lin William Cong**, University of Chicago, and **Zhiguo He**, University of Chicago and NBER, "Blockchain Disruption and Smart Contracts"
- **Victor Aguirregabiria**, University of Toronto; **Robert Clark**, Queen's University; and **Hui Wang**, Peking University, "The Geographic Flow of Bank Funding and Access to Credit: Branch Networks and Local-Market Competition"
- **Ralph Koijen**, New York University and NBER, and **Motohiro Yogo**, Princeton University and NBER, "The Fragility of Market Risk Insurance"

Summaries of these papers are at: [www.nber.org/confer/2017/FMRf17/summary.html](http://www.nber.org/confer/2017/FMRf17/summary.html)

### Trade and Labor Markets

A conference on trade and labor markets sponsored by the Smith Richardson Foundation took place in Cambridge October 13–14. Research Associates Gordon H. Hanson of the University of California, San Diego and Stephen J. Redding of Princeton University organized the meeting. These researchers' papers were presented and discussed:

- **Robert C. Feenstra**, University of California, Davis and NBER, and **Hong Ma** and **Yuan Xu**, Tsinghua University, "U.S. Exports and Employment"
- **Illenin Kondo**, University of Notre Dame, "Trade Displacement Multipliers: Theory and Evidence Using the U.S. Trade Adjustment Assistance"
- **Eunhee Lee**, University of Maryland, and **Kei-Mu Yi**, University of Houston and NBER, "Global Value Chains and Inequality with Endogenous Labor Supply"
- **Spencer Lyon**, New York University, and **Michael E. Waugh**, New York University and NBER, "Redistributing the Gains from Trade through Progressive Taxation"

- **Runjuan Liu**, University of Alberta, and **Daniel Trefler**, University of Toronto and NBER, "A Sorted Tale of Globalization: White Collar Jobs and the Rise of Service Offshoring" (NBER Working Paper No. 17559)
- **Rafael Dix-Carneiro**, Duke University and NBER, and **Brian K. Kovak**, Carnegie Mellon University and NBER, "Margins of Labor Market Adjustment to Trade" (NBER Working Paper No. 23595)
- **Justin R. Pierce**, Federal Reserve Board, and **Peter K. Schott**, Yale University and NBER, "Trade Liberalization and Investment: Evidence from the U.S. Granting of PNTR to China"
- **Benjamin G. Hyman**, University of Pennsylvania, "Can Displaced Labor Be Retrained? Evidence from Quasi-Random Assignment to Trade Adjustment Assistance"
- **Shushanik Hakobyan**, International Monetary Fund, and **John McLaren**, University of Virginia and NBER, "NAFTA and the Gender Wage Gap"
- **Brian J. Asquith**, NBER; **Sanjana Goswami** and **Antonio Rodriguez-Lopez**, University of California, Irvine; and **David Neumark**, University of California, Irvine and NBER, "U.S. Job Flows and the China Shock"

Summaries of these papers are at: [www.nber.org/confer/2017/TLMf17/summary.html](http://www.nber.org/confer/2017/TLMf17/summary.html)

### Competition and the Industrial Organization of Securities Markets

A conference on "Competition and the Industrial Organization of Securities Markets" took place in Cambridge on December 1. Tarun Chordia of Emory University, Gideon Saar of Cornell University, and Faculty Research Fellow Mao Ye of University of Illinois at Urbana-Champaign organized the meeting. These researchers' papers were presented and discussed:

- **Mariana Khapko**, University of Toronto, and **Marius A. Zoican**, Université Paris-Dauphine, "Smart Settlement"
- **Markus Baldauf**, University of British Columbia, and **Joshua J. Mollner**, Northwestern University, "Trading in Fragmented Markets"
- **John W. Hatfield**, University of Texas at Austin; **Scott Duke Kominers**, Harvard University; **Richard Lowery**, University of Texas at Austin; and **Jordan M. Barry**, University of San Diego School of Law, "Collusion in Markets with Syndication"
- **Lin William Cong**, University of Chicago, and **Zhiguo He**, University of Chicago and NBER, "Blockchain Disruption and Smart Contracts"
- **Peter H. Haslag**, Vanderbilt University, and **Matthew Ringgenberg**, University of Utah, "The Demise of the NYSE and NASDAQ: Market Quality in the Age of Market Fragmentation"
- **James Brugler**, University of Melbourne; **Carole Comerton-Forde**, University of New South Wales; and **Terrence Hendershott**, University of California at Berkeley, "Does Financial Market Structure Impact the Cost of Capital?"

Summaries of these papers are at: [www.nber.org/confer/2017/CIOf17/summary.html](http://www.nber.org/confer/2017/CIOf17/summary.html)

## Using FoodAPS for Research in Diet, Health, Nutrition, and Food Security

A conference on “Using FoodAPS for Research in Diet, Health, Nutrition, and Food Security” took place in Washington, DC, on December 7–8. Research Associates Marianne Bitler, University of California, Davis and NBER and Janet Currie, Princeton University and NBER, organized the meeting, which was sponsored by the Economic Research Service, the Food and Nutrition Service, and the U.S. Department of Agriculture. These researchers’ papers were presented and discussed:

- **Bruce D. Meyer**, University of Chicago and NBER, and **Nikolas Mittag**, CERGE-EI, “Misreporting of Government Transfers: How Important are Survey Design and Geography?”
- **David E. Frisvold**, University of Iowa and NBER, and **Joseph Price**, Brigham Young University and NBER, “The Role of School Meal Programs in the Food Environment Experienced by Children”
- **Timothy Beatty**, **Marianne Bitler**, **Xinzhe Cheng**, and **Cynthia van der Werf**, University of California, Davis, “The Pay Check Cycle”; also Beatty, Bitler, and van der Werf, “Do Food Assistance Programs Affect Retailers?”
- **Erin T. Bronchetti**, Swarthmore College; **Garret S. Christensen**, University of California, Berkeley; and **Benjamin Hansen**, University of Oregon and NBER, “USDA Food Assistance Programs (SNAP, the National School Lunch Program, and the School Breakfast Program) and Healthy Food Choices: Quasi-Experimental Evidence from Geographic Variation in Food Prices”
- **Charles J. Courtemanche** and **Rusty Tchernis**, Georgia State University and NBER, and **Augustine Denteh**, Georgia State University, “The Impacts of SNAP on Food Insecurity, Obesity, and Food Purchases: Who Misreports and Does it Matter?”
- **Amy Ellen Schwartz**, Syracuse University, and **Augustina Laurito**, New York University, “Does School Lunch Fill the ‘SNAP Gap’ at the End of the Month?”
- **Robert A. Moffitt**, Johns Hopkins University and NBER, and **Kyungmin Kang**, Johns Hopkins University, “The Effect of SNAP and School Food Programs on Food Spending, Diet Quality, and Food Security: Sensitivity to Program and Income Reporting Error”
- **Helen H. Jensen**, **Brent Kreider**, and **Oleksandr Zhyljevskyy**, Iowa State University, “Investigating Causal Effects of SNAP and WIC on Food Insecurity Using FoodAPS”
- **Jacob S. Goldin**, Stanford University; **Tatiana Homonoff**, New York University; and **Katherine H. Meckel**, Texas A&M University, “Issuance and Incidence: SNAP Benefit Cycles and Grocery Prices”
- **Di Fang**, **Aaron M. Novotny**, **Rodolfo Nayga**, and **Michael Thomsen**, University of Arkansas, “WIC Participation and Relative Quality of Household Food Purchases: Evidence from FoodAPS”

Summaries of these papers are at: [www.nber.org/confer/2017/FSf17/summary.html](http://www.nber.org/confer/2017/FSf17/summary.html)

## Neemrana Conference

The NBER, the Indian Council for Research on International Economic Relations (ICRIER), and the National Council for Applied Economic Research (NCAER) sponsored a meeting in New Delhi and Neemrana, India, on December 15–17 that included NBER researchers and economists from Indian universities, research institutions, and various government departments. The meeting was organized by NBER Research Associates Abhijit Banerjee of MIT and Gita Gopinath of Harvard University, and Rajat Kathuria of ICRIER.

The NBER participants were **Abhijit Banerjee**; **Gabriel Chowdrow-Reich**, **Douglas Elmendorf**, **Karen Dynan**, and **Amanda Pallais** of Harvard University; **Anne O. Krueger** of Johns Hopkins University; **Benjamin Moll** of Princeton University; **Joshua Rauh** of Stanford University **Lars Hansen**, **Brent Nieman**, and **Owen Zidar** of the University of Chicago; **Hilary Hoynes** of the University of California, Berkeley; **Alan Olmstead** of the University of California, Davis; and **Karthik Muralidharan** of the University of California, San Diego. A wide range of topics was discussed, including the current outlook for growth in India and the global economy, the links between productivity growth and the agricultural sector, the ways in which banks and other financial institutions influence economic growth, urbanization, the challenge of job creation in both India and the United States, skill development and the role of education, and the challenge of achieving inclusive economic growth.

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## Program and Working Group Meetings

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### Market Design

The NBER’s Working Group on Market Design met in Cambridge October 20–21. Working Group Co-Directors Michael Ostrovsky of Stanford University and Parag A. Pathak of MIT organized the meeting. These researchers’ papers were presented and discussed:

- **Haluk Ergin**, University of California, Berkeley and **Tayfun Sönmez** and **Utku Unver**, Boston College, “Efficient and Incentive Compatible Liver Exchange”
- **Nikhil Agarwal**, MIT and NBER; **Itai Ashlagi**, Stanford University; **Paulo J. Somaini**, Stanford University and NBER; **Michael A. Rees**, University of Toledo Medical Center; and **Daniel C. Waldinger**, MIT, “An Empirical Framework for Sequential Assignments: The Allocation of Deceased Donor Kidneys”
- **Eric Budish**, University of Chicago and NBER; **Robin S. Lee**, Harvard University and NBER; and **John Shim**, University of Chicago, “Will the Market Fix the Market? A Theory of Stock Market Competition and Innovation”
- **Albert Kyle**, University of Maryland, and **Jeongmin Lee**, Washington University in St. Louis, “Toward a Fully Continuous Exchange”
- **Paul Milgrom** and **Ilya Segal**, Stanford University, “Deferred-Acceptance Clock Auctions and Radio Spectrum Reallocation”

- **Lawrence Ausubel**, University of Maryland; **Christina Aperjis**, Power Auctions LLC; and **Oleg V. Baranov**, University of Colorado Boulder, “Market Design and the FCC Incentive Auction”
- **Ulrich Doraszelski** and **Katja Seim**, University of Pennsylvania and NBER; **Michael Sinkinson**, Yale University and NBER; and **Peichun Wang**, University of Pennsylvania, “Ownership Concentration and Strategic Supply Reduction” (NBER Working Paper No. 23034)

### New Directions: Transportation and Market Design

- **Michael Ostrovsky** and **Michael Schwarz**, Google Research, “Carpooling and the Economics of Self-Driving Cars”
- **Peter Cramton**, University of Maryland; **Richard Geddes**, Cornell University; and **Axel Ockenfels**, University of Cologne, “Markets for Road Use: Eliminating Congestion through Scheduling, Routing, and Real-Time Road Pricing”
- **Juan Camilo Castillo**, Stanford University; **Dan Knoepfle**, Uber; and **Glen Weyl**, Microsoft Research, “Surge Pricing Solves the Wild Goose Chase”
- **Parag A. Pathak** and **Peng Shi**, MIT, “How Well Do Structural Demand Models Work? Counterfactual Predictions in School Choices”
- **Georgy Artemov**, University of Melbourne; **Yeon-Koo Che**, Columbia University; and **Yinghua He**, Rice University, “Strategic ‘Mistakes’: Implications for Market Design Research”
- **Jacob D. Leshno** and **Irene Y. Lo**, Columbia University, “The Cutoff Structure of Top Trading Cycles in School Choice”
- **Esen Onur**, **David Reiffen**, and **Lynn Riggs**, Commodity Futures Trading Commission; and **Haoxiang Zhu**, MIT and NBER, “Mechanism Selection and Trade Formation on Swap Execution Facilities: Evidence from Index CDS Trades”
- **Constantinos Daskalakis**, MIT; **Christos H. Papadimitriou**, University of California, Berkeley; and **Christos Tzamos**, Microsoft Research, “Does Information Revelation Improve Revenue?”
- **Dirk Bergemann**, Yale University, and **Tibor Heumann** and **Stephen Morris**, Princeton University, “Information and Market Power”

### New Directions: Development Economics and Market Design

- **Jean-François Houde**, Cornell University and NBER; **Terence R. Johnson**, University of Notre Dame; **Molly Lipscomb**, University of Virginia; and **Laura A. Schechter**, University of Wisconsin, Madison, “Using Market Mechanisms to Increase the Take-up of Improved Sanitation in Senegal”
- **Reshmaan N. Hussam**, Yale University, and **Natalia Rigol** and **Benjamin N. Roth**, MIT, “Targeting High Ability Entrepreneurs Using Community Information: Mechanism Design in the Field”
- **Yusuke Narita**, Yale University, “Experimental Design as Market Design: Billions of Dollars Worth of Treatment Assignments”

Summaries of these papers are at: [www.nber.org/confer/2017/MDf17/summary.html](http://www.nber.org/confer/2017/MDf17/summary.html)

## Public Economics

Members of the NBER’s Public Economics Program met at the Stanford Institute for Economic Policy Research on October 26–27. Program Director Raj Chetty of Stanford University and Faculty Research Fellow Danny Yagan of the University of California, Berkeley organized the meeting. These researchers’ papers were presented and discussed:

- **Amy Finkelstein**, MIT and NBER, and **Nathaniel Hendren** and **Mark Shepard**, Harvard University and NBER, “Subsidizing Health Insurance for Low-Income Adults: Evidence from Massachusetts” (NBER Working Paper No. 23668)
- **Mark Duggan**, Stanford University and NBER, and **Atul Gupta** and **Emilie Jackson**, Stanford University, “The Impact of the Affordable Care Act: Evidence from California’s Hospital Sector”
- **Alexander M. Gelber**, University of California, Berkeley and NBER; **Timothy J. Moore**, University of Melbourne; and **Alexander Strand**, Social Security Administration, “Disability Insurance Income Saves Lives”
- **Ethan Lieber**, University of Notre Dame, and **Lee Lockwood**, University of Virginia and NBER, “Targeting with In-kind Transfers: Evidence from Medicaid Home Care”
- **Philip Armour**, RAND Corporation, and **Michael Lovenheim**, Cornell University and NBER, “The Effect of Social Security Information on the Labor Supply and Savings of Older Americans”
- **Peter Ganong**, University of Chicago and NBER, and **Pascal Noel**, University of Chicago, “Consumer Spending During Unemployment: Positive and Normative Implications”
- **Rebecca Diamond**, Stanford University and NBER, and **Timothy McQuade** and **Franklin Qian**, Stanford University, “The Effects of Rent Control Expansion on Tenants, Landlords, and Inequality: Evidence from San Francisco”
- **Marcelo L. Bérigolo**, **Rodrigo Ceni**, and **Matias Giacobasso**, IECON-UDELAR; **Guillermo Cruces**, Centro de Estudios Distributivos, Laborales y Soci; and **Ricardo Perez-Truglia**, University of California, Los Angeles and NBER, “Tax Audits as Scarecrows: Evidence from a Large-Scale Field Experiment” (NBER Working Paper No. 23631)
- **Katrine Jakobsen**, University of Copenhagen; **Kristian Jakobsen**, Kraka; **Henrik Kleven**, Princeton University; and **Gabriel Zucman**, University of California, Berkeley and NBER, “Wealth Taxation and Wealth Accumulation: Theory and Evidence from Denmark”

Summaries of these papers are at: [www.nber.org/confer/2017/PEf17/summary.html](http://www.nber.org/confer/2017/PEf17/summary.html)

## Economic Fluctuations and Growth

Members of the NBER's Economic Fluctuations and Growth Program met in Chicago on October 27. Research Associates Mark A. Aguiar of Princeton University and John V. Leahy of University of Michigan organized the meeting. These researchers' papers were presented and discussed:

- **Matthew Smith**, U.S. Department of the Treasury; **Danny Yagan**, University of California, Berkeley and NBER; and **Owen M. Zidar** and **Eric Zwick**, University of Chicago and NBER, "Capitalists in the Twenty-First Century"
- **Ricardo J Caballero** and **Alp Simsek**, MIT and NBER, "A Risk-centric Model of Demand Recessions and Macroeconomic Policy" (NBER Working Paper No. [23614](#))
- **Jason Faberman**, Federal Reserve Bank of Chicago; **Andreas I. Mueller**, Columbia University and NBER; and **Ayşegül Şahin** and **Giorgio Topa**, Federal Reserve Bank of New York, "Job Search Behavior among the Employed and Non-Employed" (NBER Working Paper No. [23731](#))
- **Germán Gutiérrez**, New York University, and **Thomas Philippon**, New York University and NBER, "Declining Competition and Investment in the U.S." (NBER Working Paper No. [23583](#))
- **Stefania Albanesi**, University of Pittsburgh and NBER; **Giacomo De Giorgi**, GSEM-University of Geneva; and **Jaromír Nosal**, Boston College, "Credit Growth and the Financial Crisis: A New Narrative" (NBER Working Paper No. [23740](#))
- **Anmol P. Bhandari**, University of Minnesota; **David Evans**, University of Oregon; **Mikhail Golosov**, Princeton University and NBER; and **Thomas J. Sargent**, New York University and NBER, "Inequality, Business Cycles, and Fiscal-Monetary Policy"

Summaries of these papers are at: [www.nber.org/confer/2017/EFGf17/summary.html](http://www.nber.org/confer/2017/EFGf17/summary.html)

## International Finance and Macroeconomics

Members of the NBER's International Finance and Macroeconomics Program met in Cambridge on October 27. Research Associates Guido Lorenzoni of Northwestern University and Vivian Yue of Emory University organized the meeting. These researchers' papers were presented and discussed:

- **Doireann Fitzgerald**, Federal Reserve Bank of Minneapolis and NBER; **Yaniv Yedid-Levi**, University of British Columbia; and **Stefanie Haller**, University College Dublin, "Can Sticky Quantities Explain Exchange Rate Disconnect?"
- **Javier Bianchi**, Federal Reserve Bank of Minneapolis and NBER; **Pablo Ottonello**, University of Michigan; and **Ignacio Presno**, Board of Governors of the Federal Reserve System, "Fiscal Policy, Sovereign Risk, and Unemployment"
- **John D. Burger**, Loyola University Maryland; **Francis E. Warnock**, University of Virginia and NBER; and **Veronica Cacad Warnock**, University of Virginia, "Currency Matters: Analyzing International Bond Portfolios" (NBER Working Paper No. [23175](#))

- **Yusuf Soner Baskaya**, University of Glasgow; **Julian di Giovanni**, ICREA-Universitat Pompeu Fabra; **Sebnem Kalemli-Ozcan**, University of Maryland and NBER; and **Mehmet Fatih Ulu**, California Business Roundtable, "International Spillovers and Local Credit Cycles" (NBER Working Paper No. [23149](#))

- **Andrew K. Rose**, University of California at Berkeley and NBER; **Stijn Claessens**, Bank for International Settlements; and **Eugenio M Cerutti**, International Monetary Fund, "How Important is the Global Financial Cycle? Evidence from Capital Flows" (NBER Working Paper No. [23699](#))

- **Christopher Erceg**, **Andrea Prestipino**, and **Andrea Raffo**, Federal Reserve Board, "The Macroeconomic Effects of Trade Policies"

- **Tomas Williams**, Universitat Pompeu Fabra, "Capital Inflows, Sovereign Debt and Bank Lending: Micro-Evidence from an Emerging Market"

Summaries of these papers are at: [www.nber.org/confer/2017/IFMf17/summary.html](http://www.nber.org/confer/2017/IFMf17/summary.html)

## Monetary Economics

Members of the NBER's Monetary Economics Program met in Cambridge on November 3. Research Associate Valerie A. Ramey of University of California, San Diego and Faculty Research Fellow Johannes Wieland of the University of California, San Diego organized the meeting. These researchers' papers were presented and discussed:

- **Germán Gutiérrez**, New York University, and **Thomas Philippon**, New York University and NBER, "Declining Competition and Investment in the U.S." (NBER Working Paper No. [23583](#))

- **Nicolas Crouzet**, Northwestern University, and **Neil Mehrotra**, Federal Reserve Bank of Minneapolis, "Small and Large Firms over the Business Cycle"

- **George-Marios Angeletos**, MIT and NBER, and **Chen Lian**, MIT, "Forward Guidance without Common Knowledge" (NBER Working Paper No. [22785](#))

- **Stephan Luck** and **Tom Zimmermann**, Federal Reserve Board, "Employment Effects of Unconventional Monetary Policy: Evidence from QE"

- **Christopher Martin** and **Alexander Ufier**, FDIC, and **Manju Puri**, Duke University and NBER, "On Deposit Stability in Failing Banks"

- **Sigríður Benediktsdóttir**, Yale University; **Gauti B. Eggertsson**, Brown University and NBER; and **Eggert Þórarinnsson**, Central Bank of Iceland, "The Rise, the Fall, and the Resurrection of Iceland"

Summaries of these papers are at: [www.nber.org/confer/2017/MEf17/summary.html](http://www.nber.org/confer/2017/MEf17/summary.html)



## Political Economy

Members of the NBER's Political Economy Program met in Cambridge on November 3. Program Director Alberto A. Alesina of Harvard University organized the meeting. These researchers' papers were presented and discussed:

- **Stelios Michalopoulos**, Brown University and NBER, and **Melanie Meng Xue**, Northwestern University, "Folklore"
- **Paola Giuliano**, University of California, Los Angeles and NBER, and **Nathan Nunn**, Harvard University and NBER, "Understanding Cultural Persistence and Change" (NBER Working Paper No. [23617](#))
- **Alberto F. Alesina**; **Bryony Reich**, Northwestern University; and **Alessandro Riboni**, École Polytechnique, "Nation-Building, Nationalism and Wars" (NBER Working Paper No. [23435](#))
- **Julia Cage**, Sciences Po, and **Yasmine Bekkouche**, Paris School of Economics, "The Price of a Vote: Evidence from France, 1993–2014"
- **Ufuk Akcigit**, University of Chicago and NBER; **Salomé Baslandze**, Einaudi Institute for Economics and Finance; and **Francesca Lotti**, Bank of Italy, "Connecting to Power: Political Connections, Innovation, and Firm Dynamics"
- **James E. Alt**, Harvard University; **David Lassen**, University of Copenhagen; and **Sebastian Barfort**, London School of Economics and Political Science, "The Effect of Income and Unemployment Shocks on Political Preferences"

Summaries of these papers are at: [www.nber.org/confer/2017/POLf17/summary.html](http://www.nber.org/confer/2017/POLf17/summary.html)

## Behavioral Finance

The NBER's Working Group on Behavioral Finance met in Cambridge on November 3. Working Group Director Nicholas Barberis of Yale University organized the meeting. These researchers' papers were presented and discussed:

- **Augustin Landier**, Toulouse School of Economics; **Yueran Ma**, Harvard University; and **David Thesmar**, MIT, "New Experimental Evidence on Expectations Formation"
- **Lawrence J. Jin** and **Pengfei Sui**, California Institute of Technology, "Asset Pricing with Return Extrapolation"
- **Ned Augenblick**, University of California, Berkeley, and **Eben Lazarus**, Harvard University, "Restrictions on Asset-Price Movements under Rational Expectations: Theory and Evidence"
- **Christian Leuz**, University of Chicago and NBER; **Steffen Meier** and **Andreas Hackethal**, Goethe University; **Maximilian Muhn**, Humboldt University; and **Eugene F. Soltes**, Harvard University, "Who Falls Prey to the Wolf of Wall Street? Investor Participation in Market Manipulation"
- **Laurent E. Calvet**, HEC Paris; **Claire Celerier**, University of Toronto; **Paolo Sodini**, Stockholm School of Economics; and **Boris Vallee**, Harvard University, "Can Financial Innovation Solve Household Reluctance to Take Risk?"
- **Francesco D'Acunto**, **Nagpurnanand R. Prabhala**, and **Alberto G. Rossi**, University of Maryland, "The Promises and Pitfalls of Robo-advising"

Summaries of these papers are at: [www.nber.org/confer/2017/BFf17/summary.html](http://www.nber.org/confer/2017/BFf17/summary.html)

## Corporate Finance

Members of the NBER's Corporate Finance Program met at Stanford on November 10. Faculty Research Fellow Shai Bernstein of Stanford University and Research Associates Peter M. DeMarzo of Stanford University and Bruce I. Carlin of University of California, Los Angeles organized the meeting. These researchers' papers were presented and discussed:

- **Di Li**, Georgia State University; **Lucian A. Taylor**, University of Pennsylvania; and **Wenyu Wang**, Indiana University, "Inefficiencies and Externalities from Opportunistic Acquirers"
- **Victoria Vanasco**, Stanford University; **Brendan Daley**, Duke University; and **Brett Green**, University of California, Berkeley, "Securitization, Ratings, and Credit Supply"
- **Gabriel Chodorow-Reich**, Harvard University and NBER, and **Antonio Falato**, Federal Reserve Board, "The Loan Covenant Channel: How Bank Health Transmits to the Real Economy" (NBER Working Paper No. [23879](#))
- **Roni Michaely**, Cornell Tech; **Stefano Rossi**, Bocconi University; and **Michael Weber**, University of Chicago and NBER, "The Information Content of Dividends: Safer Profits, not Higher Profits"
- **Taylor Begley**, Washington University in St. Louis, and **Amiyatosh Purnanandam**, University of Michigan, "Color and Credit: Race, Regulation, and the Quality of Financial Services"
- **Lin William Cong**, University of Chicago, and **Yizhou Xiao**, Chinese University of Hong Kong, "Persistent Blessings of Luck"
- **Joao Granja**, University of Chicago, and **Christian Leuz**, University of Chicago and NBER, "The Death of a Regulator: Strict Supervision, Bank Lending and Business Activity"
- **Matthew Smith**, Department of Treasury; **Danny Yagan**, University of California, Berkeley and NBER; and **Owen M. Zidar** and **Eric Zwick**, University of Chicago and NBER, "Capitalists in the Twenty-First Century"

Summaries of these papers are at: [www.nber.org/confer/2017/CFf17/summary.html](http://www.nber.org/confer/2017/CFf17/summary.html)

## Asset Pricing

Members of the NBER's Asset Pricing Program met at Stanford on November 10. Research Associates Leonid Kogan and Jun Pan of MIT organized the meeting. These researchers' papers were presented and discussed:

- **Michael Gofman**, University of Rochester; **Gill Segal**, University of North Carolina at Chapel Hill; and **Youchang Wu**, University of Oregon, "Production Networks and Stock Returns: The Role of Creative Destruction"
- **Ricardo J Caballero** and **Alp Simsek**, MIT and NBER, "A Risk-centric Model of Demand Recessions and Macroeconomic Policy" (NBER Working Paper No. 23614)
- **Azi Ben-Rephael**, Indiana University; **Bruce I. Carlin**, University of California, Los Angeles and NBER; **Zhi Da**, University of Notre Dame; and **Ryan D. Israelsen**, Michigan State University, "Demand for Information and Asset Pricing" (NBER Working Paper No. 23274)
- **Antonio Falato**, Federal Reserve Board; **Ali Hortaçsu**, University of Chicago and NBER; and **Dan Li** and **Chaehee Shin**, Federal Reserve Board, "Fire-Sale Spillovers in Debt Markets"
- **Carolyn Pflueger**, University of British Columbia; **Emil Siriwardane**, Harvard University; and **Adi Sunderam**, Harvard University and NBER, "Does Precautionary Savings Drive the Real Interest Rate? Evidence from the Stock Market"
- **Anna Cieslak**, Duke University, and **Annette Vissing-Jorgensen**, University of California, Berkeley and NBER, "The Economics of the Fed Put"

Summaries of these papers are at: [www.nber.org/confer/2017/APf17/summary.html](http://www.nber.org/confer/2017/APf17/summary.html)

## Education

Members of the NBER's Education Program met in Cambridge on November 16–17. Program Director Caroline Hoxby of Stanford University organized the meeting. These researchers' papers were presented and discussed:

- **Nathan Petek**, Federal Trade Commission, and **Nolan G. Pope**, University of Maryland, "The Multidimensional Impact of Teachers on Students"
- **Jason B. Cook**, University of Pittsburgh, "Segregation, Student Achievement, and Postsecondary Attainment: Evidence from the Introduction of Race-Blind Magnet School Lotteries"
- **Anjali Adukia**, University of Chicago; **Sam E. Asher**, World Bank; and **Paul Novosad**, Dartmouth College, "Educational Investment Responses to Economic Opportunity: Evidence from Indian Road Construction"
- **Luis Armona**, Stanford University; **Rajashri Chakrabarti**, Federal Reserve Bank of New York; and **Michael Lovenheim**, Cornell University and NBER, "How Does For-Profit College Attendance Affect Student Loans, Defaults and Earnings?"

- **Justine S. Hastings**, Brown University and NBER; **Christopher Neilson**, Princeton University and NBER; and **Seth D. Zimmerman**, University of Chicago and NBER, "The Effects of Earnings Disclosure on College Enrollment Decisions" (NBER Working Paper No. 21300)
- **Hugh Macartney**, Duke University and NBER, and **John D. Singleton**, Duke University, "School Boards and Student Segregation" (NBER Working Paper No. 23619)
- **Michael Gilraine**, New York University, "School Accountability and the Dynamics of Human Capital Formation"
- **William N. Evans**, University of Notre Dame and NBER; **Melissa Schettini Kearney**, University of Maryland and NBER; and **Brendan C. Perry** and **James X. Sullivan**, University of Notre Dame, "Increasing Community College Completion Rates among Low-Income Students: Evidence from a Randomized Controlled Trial Evaluation of a Case Management Intervention"
- **Elizabeth Setren**, MIT, "Special Education and English Language Learner Students in Boston Charter Schools: Impact and Classification"
- **Tahir Andrabi**, Pomona College; **Jishnu Das**, World Bank; **Asim Khwaja**, Harvard University and NBER; **Selcuk Ozyurt**, Sabanci University; and **Niharika Singh**, Harvard University, "Upping the Ante: The Equilibrium Effects of Unconditional Grants to Private Schools"
- **Matthew S. Davis**, University of Pennsylvania, and **Fernando Ferreira**, University of Pennsylvania and NBER, "Housing Disease and Public School Finances"
- **Lina M. Cardona Sosa**, Central Bank of Colombia, and **Katja Kaufmann**, Mannheim University, "Gender Peer Effects, Non-Cognitive Skills and Marriage Market Outcomes: Evidence from Single-Sex Schools in the UK"

Summaries of these papers are at: [www.nber.org/confer/2017/EDf17/summary.html](http://www.nber.org/confer/2017/EDf17/summary.html)

## Organizational Economics

The NBER's Working Group on Organizational Economics met in Cambridge on November 17–18. Working Group Director Robert Gibbons of MIT organized the meeting. These researchers' papers were presented and discussed:

- **Nicholas Bloom**, Stanford University and NBER; **Aprajit Mahajan**, University of California, Berkeley and NBER; **David McKenzie**, World Bank; and **John Roberts**, Stanford University, "Do Management Improvements Persist? Evidence from India"
- **Camelia M Kuhn**, University of North Carolina at Chapel Hill and NBER, and **Saravanan Kesavan**, University of North Carolina at Chapel Hill, "Demand Fluctuations, Precarious Incomes, and Employee Turnover"
- **Michael Waldman**, Cornell University, and **Xin Jin**, University of South Florida, "Lateral Moves, Promotions, and Task-Specific Human Capital: Theory and Evidence"
- **Drew Fudenberg**, Harvard University, and **Luis Rayo**, University of Utah, "Training and Effort Dynamics in Apprenticeship"

- **Tianjiao Dai** and **Juuso Toikka**, MIT, “Robust Incentives for Teams”
- **Tarek F. Ghani**, Washington University in St Louis, and **Tristan Reed**, University of Chicago, “Relationships, Risk and Rents: Evidence from a Market for Ice”
- **Wouter Dessein** and **Andrea Prat**, Columbia University, “Organizational Capital, Corporate Leadership, and Firm Dynamics”
- **Marco LiCalzi** and **Massimo Warglien**, Ca’ Foscari University of Venice, and **Robert S. Gibbons**, “What Situation Is This? Coarse Cognition and Behavior over a Space of Games”
- **Eliza Forsythe**, University of Illinois-Urbana, “Occupational Job Ladders and the Efficient Reallocation of Displaced Workers”
- **Guido Friebel** and **Nick Zubanov**, Goethe University Frankfurt, and **Matthias Heinz**, University of Cologne, “Making Managers Matter”
- **David C. Chan, Jr.**, Stanford University and NBER, and **Michael J. Dickstein**, New York University and NBER, “Price-setting by Committee: Evidence from Medicare”

Summaries of these papers are at: [www.nber.org/confer/2017/OEf17/summary.html](http://www.nber.org/confer/2017/OEf17/summary.html)

## Labor Studies

Members of the NBER’s Labor Studies Program met in Cambridge on December 1. Program Co-Directors David Autor of MIT and Alexandre Mas of Princeton University organized the meeting. These researchers’ papers were presented and discussed:

- **Peter Q. Blair** and **Bobby Chung**, Clemson University, “Occupational Licensing Reduces Racial and Gender Wage Gaps”
- **Atila Abdulkadiroglu**, Duke University and NBER; **Parag A. Pathak**, Massachusetts Institute of Technology and NBER; **Jonathan T. Schellenberg**, University of California, Berkeley; and **Christopher R. Walters**, University of California, Berkeley and NBER, “Do Parents Value School Effectiveness?” (NBER Working Paper No. 23912)
- **Rebecca Diamond**, Stanford University and NBER, and **Timothy McQuade** and **Franklin Qian**, Stanford University, “The Effects of Rent Control Expansion on Tenants, Landlords, and Inequality: Evidence from San Francisco”
- **Joakim Ruist**, Gothenburg University; **Jan Stuhler**, University Carlos III; and **David A. Jaeger**, City University of New York and NBER, “Shift-Share Instruments and the Impact of Immigration”
- **Bo Cowgill**, Columbia University, “The Value of an Additional Job Offer”
- **Damon Jones**, University of Chicago and NBER, and **Ioana Marinescu**, University of Pennsylvania and NBER, “The Labor Market Impacts of Universal and Permanent Cash Transfers: Evidence from the Alaska Permanent Fund”

Summaries of these papers are at: [www.nber.org/confer/2017/LSf17/summary.html](http://www.nber.org/confer/2017/LSf17/summary.html)

## International Trade and Investment

Members of the NBER’s International Trade and Investment Program met at Stanford on December 1–2. Program Director Stephen J. Redding of Princeton University organized the meeting. These researchers’ papers were presented and discussed:

- **Victor Couture**, University of California, Berkeley; **Benjamin Faber**, University of California, Berkeley and NBER; **Yizhen Gu**, Jinan University; and **Lizhi Liu**, Stanford University, “E-Commerce Integration and Economic Development: Evidence from China”
- **Stephan Heblich**, University of Bristol; **Stephen J. Redding**, Princeton University and NBER; and **Daniel Sturm**, London School of Economics, “The Making of the Modern Metropolis: Evidence from London”
- **Lorenzo Caliendo**, Yale University and NBER; **Luca David Opmolla**, Banco de Portugal; **Fernando Parro**, Johns Hopkins University; and **Alessandro Sforza**, London School of Economics, “Goods and Factor Market Integration: A Quantitative Assessment of the EU Enlargement” (NBER Working Paper No. 23695)
- **Wolfgang Keller**, University of Colorado and NBER, and **William W. Olney**, Williams College, “Globalization and Executive Compensation” (NBER Working Paper No. 23384)
- **Andrew B. Bernard**, Dartmouth College and NBER; **Emmanuel Dhyne**, National Bank of Belgium; **Glenn C.G. Magerman**, ECARES & NBB; **Kalina Manova**, University of Oxford; and **Andreas Moxnes**, University of Oslo, “The Origins of Firm Heterogeneity: A Production Network Approach”
- **Chong Xiang**, Purdue University, and **Stephen Yeaple**, Pennsylvania State University and NBER, “The Production of Cognitive and Non-cognitive Human Capital in the Global Economy”
- **Sumit Agarwal**, Georgetown University; **J. Bradford Jensen**, Georgetown University and NBER; and **Ferdinando Monte**, Georgetown University, “The Geography of Consumption” (NBER Working Paper No. 23616)
- **Thibault Fally**, University of California, Berkeley and NBER, and **James E. Sayre**, University of California, Berkeley, “Commodity Trade Matters”
- **Jonathan I. Dingel**, University of Chicago and NBER; **Solomon M. Hsiang**, University of California, Berkeley and NBER; and **Kyle C. Meng**, University of California, Santa Barbara and NBER, “The Spatial Structure of Endowments, Trade, and Inequality: Evidence from the Global Climate”

Summaries of these papers are at: [www.nber.org/confer/2017/ITIf17/summary.html](http://www.nber.org/confer/2017/ITIf17/summary.html)

## Entrepreneurship

The NBER's Working Group on Entrepreneurship met on December 8 in Cambridge. Josh Lerner of Harvard University and Entrepreneurship Working Group Director Antoinette Schoar of MIT organized the meeting, which was sponsored by the Ewing Marion Kauffman Foundation. These researchers' papers were presented and discussed:

- **Ufuk Akcigit**, University of Chicago and NBER; **Salomé Baslandze**, Einaudi Institute for Economics and Finance; and **Francesca Lotti**, Bank of Italy, "Connecting to Power: Political Connections, Innovation, and Firm Dynamics"
- **Meghana Ayyagari**, George Washington University, and **Vojislav Maksimovic**, University of Maryland, "Human Capital, Competition, and Entrepreneurial Success in Manufacturing"
- **Michael Ewens**, California Institute of Technology, and **Richard Townsend**, University of California, San Diego, "Are Early Stage Investors Biased Against Women?"
- **Geraldo Cerqueiro**, Universidade Catolica Portuguesa; **Maria Fabiana Penas**, Universidad Torcuato Di Tella; and **Robert Seamans**, New York University, "Debtor Protection and Firm Dynamics"
- **Charlie Eaton**, University of California at Merced; **Sabrina T. Howell**, New York University and NBER; and **Constantine N. Yannelis**, New York University, "When Owner and Customer Incentives Diverge: Private Equity in Higher Education"
- **Joshua L. Krieger**, Harvard Business School; **Danielle Li**, MIT and NBER; and **Dimitris Papanikolaou**, Northwestern University and NBER, "Developing Novel Drugs"
- **Colleen M. Cunningham**, London Business School; **Florian Ederer**, Yale University; and **Song Ma**, Yale University, "Killer Acquisitions"

Summaries of these papers are at: [www.nber.org/confer/2017/ENTf17/summary.html](http://www.nber.org/confer/2017/ENTf17/summary.html)

## Health Care

Members of the NBER's Health Care Program met December 8 in Cambridge. Program Director Jonathan Gruber of MIT organized the meeting. These researchers' papers were presented and discussed:

- **Joshua L. Krieger**, Harvard Business School; **Danielle Li**, MIT and NBER; and **Dimitris Papanikolaou**, Northwestern University and NBER, "Developing Novel Drugs"
- **Liran Einav**, Stanford University and NBER; **Amy Finkelstein**, Massachusetts Institute of Technology and NBER; and **Pietro Tebaldi**, University of Chicago, "Risk Adjustment vs. Subsidies in the Design of Health Insurance Exchanges"
- **Elena Prager**, Northwestern University, "Consumer Responsiveness to Simple Health Care Prices: Evidence From Tiered Hospital Networks"
- **David Dranove** and **Christopher Ody**, Northwestern University, and **Amanda Starc**, Northwestern University and NBER, "A Dose of Managed Care: Controlling Drug Spending in Medicaid" (NBER Working Paper No. 23956)
- **Steve Cicala**, University of Chicago and NBER; **Ethan Lieber**, University of Notre Dame; and **Victoria R. Marone**, Northwestern University, "Cost of Service Regulation in U.S. Health Care: Minimum Medical Loss Ratios" (NBER Working Paper No. 23353)
- **Leora Friedberg**, University of Virginia; **Wenliang Hou**, Center for Retirement Research at Boston College; **Wei Sun**, Renmin University; and **Anthony Webb**, the New School, "Lapses in Long-Term Care Insurance"

Summaries of these papers are at: [www.nber.org/confer/2017/HCF17/summary.html](http://www.nber.org/confer/2017/HCF17/summary.html)

## Insurance

The NBER's Insurance Working Group met December 9 in Cambridge. Working Group Co-Directors Benjamin R. Handel of the University of California, Berkeley and Motohiro Yogo of Princeton University organized the meeting. These researchers' papers were presented and discussed:

- **Ralph Koijen**, New York University and NBER, and **Motohiro Yogo**, Princeton University and NBER, "The Fragility of Market Risk Insurance"
- **Johan Hombert** and **Victor Lyonnet**, HEC Paris, "Intergenerational Risk Sharing in Life Insurance: Evidence from France"
- **Yiling Deng**, Georgia State University; **James Tyler Leverty**, University of Wisconsin-Madison; and **George Zanjani**, University of Alabama, "Market Discipline and Government Guarantees: Evidence from the Insurance Industry"
- **Shan Ge**, The Ohio State University, "How Do Financial Constraints Affect Product Pricing? Evidence from Weather and Life Insurance Premiums"

Summaries of these papers are at: [www.nber.org/confer/2017/INSf17/summary.html](http://www.nber.org/confer/2017/INSf17/summary.html)

## NBER Development Economics/BREAD

The NBER Development Economics Program met jointly with the Bureau for Research and Economic Analysis of Development (BREAD) on December 8-9 in Cambridge. Research Associates Raymond Fisman of Boston University, Pinelopi K. Goldberg of Yale University, Rema Hanna of Harvard University, Michael Kremer of Harvard University, and Program Director Duncan Thomas of Duke University organized the meeting. These researchers' papers were presented and discussed:

- **Arun Advani**, University of Warwick, "Insurance Networks and Poverty Traps"
- **Imran Rasul**, University College London; **Oriana Bandiera** and **Robin Burgess**, London School of Economics; and **Vittorio Bassi**, University of Southern California, "Tackling Youth Unemployment: Evidence from a Labor Market Experiment in Uganda"
- **Kelsey Jack**, Tufts University and NBER; **Günther Fink**, Swiss Tropical and Public Health Institute; and **Felix Masiye**, University of Zambia, "Seasonal Liquidity, Rural Labor Markets and Agricultural Production: Evidence from Zambia"
- **Lorenzo Casaburi**, University of Zurich, and **Jack J. Willis**, Harvard University, "Time vs. State in Insurance: Experimental Evidence from Contract Farming in Kenya"
- **Andrew Foster**, Brown University and NBER, and **Mark Rosenzweig**, Yale University and NBER, "Are There Too Many Farms in the World? Labor-Market Transactions Costs, Machine Capacities and Optimal Farm Size" (NBER Working Paper No. 23909)
- **Esther Duflo**, Massachusetts Institute of Technology and NBER; **Pascaline Dupas**, Stanford University and NBER; and **Michael Kremer**, Harvard University and NBER, "The Impact of Free Secondary Education: Experimental Evidence from Ghana"
- **Marshall Burke**, Stanford University and NBER; **Lauren F. Bergquist**, Becker Friedman Institute; and **Edward Miguel**, University of California, Berkeley and NBER, "Selling Low and Buying High: Arbitrage and Local Price Effects in Kenyan Markets"

Summaries of these papers are at: [www.nber.org/confer/2017/DEVf17/summary.html](http://www.nber.org/confer/2017/DEVf17/summary.html)

## Chinese Economy

The NBER's Working Group on the Chinese Economy met December 15-16 in Shenzhen, China. Research Associates Hanming Fang of the University of Pennsylvania, Zhiguo He of the University of Chicago, Wei Xiong of Princeton University, and Working Group Director Shang-Jin Wei of Columbia University organized the meeting in cooperation with the Chinese University of Hong Kong, Shenzhen. These researchers' papers were presented and discussed:

- **Pravin Krishna**, Johns Hopkins University and NBER, and **Heiwai Tang**, Johns Hopkins University, "Production Networks and Misallocation"
- **Xing Li**, Stanford University; **Chong Liu**, Peking University; **Xi Weng**, Peking University; and **Li-An Zhou**, Peking University, "Target Setting in Tournaments: Theory and Evidence from China"
- **Zheng Liu**, Federal Reserve Bank of San Francisco; **Pengfei Wang**, Hong Kong University of Science & Technology; and **Zhiwei Xu**, Shanghai Jiao Tong University, "Interest-Rate Liberalization and Capital Misallocation"
- **Bingjing Li**, National University of Singapore, and **Hiroyuki Kasahara**, University of British Columbia, "The Causes of China's Great Famine, 1959-61: County-Level Evidence"
- **Victor Couture**, University of California, Berkeley; **Benjamin Faber**, University of California, Berkeley and NBER; **Yizhen Gu**, Jinan University; and **Lizhi Liu**, Stanford University, "E-Commerce Integration and Economic Development: Evidence from China"
- **Yu Zhang**, Peking University, "Liquidity Constraints, Transition Dynamics, and the Chinese Housing Return Premium"
- **Haoyuan Ding**, Shanghai University of Finance and Economics; **Hanming Fang**, University of Pennsylvania and NBER; **Shu Lin**, Chinese University of Hong Kong; and **Kang Shi**, Chinese University of Hong Kong, "Equilibrium Consequences of Corruption on Firms: Evidence from China's Anti-Corruption Campaign"
- **Jiangze Bian**, University of International Business and Economics; **Zhi Da**, University of Notre Dame; **Dong Lou**, London School of Economics; and **Hao Zhou**, Tsinghua University, "Leverage Network and Market Contagion"
- **Yi Huang** and **Ugo Panizza** of The Graduate Institute, Geneva; and **Marco Pagano**, University of Naples Federico II, "Local Crowding Out in China"
- **Franklin Allen**, Imperial College London and NBER; **Xian Gu**, Central University of Finance and Economics; **Jun Qian**, Fudan University; and **Yiming Qian**, University of Iowa, "Implicit Guarantee and Shadow Banking: The Case of Trust Products"
- **Haoyu Gao**, Central University of Finance and Economics; **Hong Ru**, Nanyang Technological University; **Robert Townsend**, MIT and NBER; and **Xiaoguang Yang**, Chinese Academy of Sciences, "Rise of Bank Competition: Evidence from Banking Deregulation in China"
- **Sabrina T. Howell**, New York University and NBER; **Lin William Cong**, University of Chicago; and **Ran Zhang**, Peking University, "The Impact of Delay in Going Public: Evidence from China"

Summaries of these papers are at: [www.nber.org/confer/2017/CEf17/summary.html](http://www.nber.org/confer/2017/CEf17/summary.html)

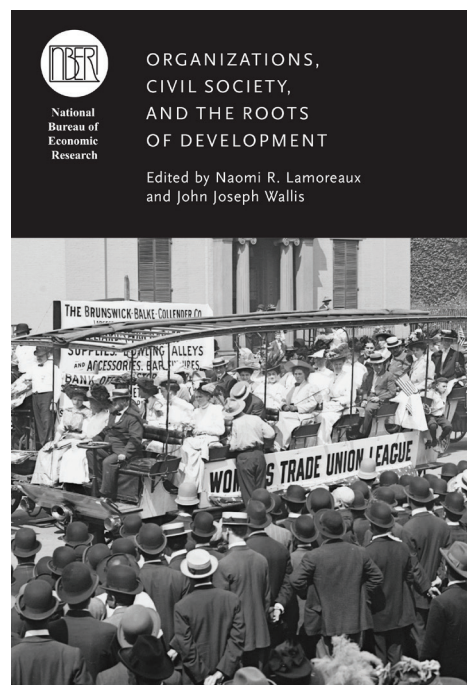
## Organizations, Civil Society, and the Roots of Development

Edited by Naomi R. Lamoreaux and John Joseph Wallis  
\$130

Modern developed nations are rich and politically stable in part because their citizens are free to form organizations and have access to the relevant legal resources. Yet in spite of the advantages of open access to civil organizations, it is estimated that 80 percent of people live in countries that do not allow unfettered access. Why have some countries disallowed the formation of civic organizations as part of their economic and political systems?

The contributions to *Organizations, Civil Society, and the Roots of Development* seek to answer this question through an exploration of how developing nations throughout the 18th and 19th centuries, including the United States, United Kingdom, France, and Germany, made the tran-

sition to allowing their citizens the right to form organizations. The transition, contributors show, was not an easy one. Neither political changes brought about by revolution nor subsequent economic growth led directly to open access. In fact, initial patterns of change were in the opposite direction, as political coalitions restricted access to specific organizations for the purpose of maintaining political control. Ultimately, however, it became clear that these restrictions threatened the foundation of social and political order. Tracing the path of these modern civil societies, *Organizations, Civil Society, and the Roots of Development* is an invaluable contribution to all interested in today's developing countries and the challenges they face in developing this organizational capacity



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## Clashing over Commerce: A History of U.S. Trade Policy

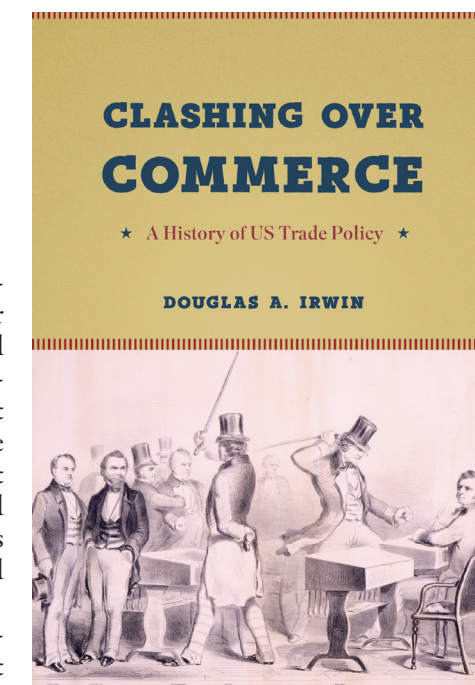
Douglas A. Irwin  
\$35

Should the United States be open to commerce with other countries, or should it protect domestic industries from foreign competition? This question has been the source of bitter political conflict throughout American history. Such conflict was inevitable, James Madison argued in *The Federalist Papers*, because trade policy involves clashing economic interests. The struggle between the winners and losers from trade has always been fierce because dollars and jobs are at stake: depending on the policy chosen, some industries, farmers, and workers will prosper, while others will suffer.

*Clashing over Commerce: A History of U.S. Trade Policy* is the most authoritative and comprehensive history of U.S. trade policy to date, offering a clear picture of the various economic and political forces that have shaped it. From the start, trade policy divided the nation—first when Thomas Jefferson declared an embargo on all foreign

trade, then when South Carolina threatened to secede from the Union over excessive taxes on imports. The Civil War saw a shift toward protectionism, which then came under constant political attack. Controversy over the Smoot-Hawley tariff during the Great Depression led to a policy shift toward freer trade, involving trade agreements that eventually produced the World Trade Organization.

Irwin makes sense of this turbulent history by showing how different economic interests tend to be grouped geographically, meaning that every proposed policy change found ready champions and opponents in Congress. As the Trump administration considers making major changes to U.S. trade policy, Irwin's sweeping historical perspective helps illuminate the current debate. Deeply researched and rich with insight and detail, *Clashing over Commerce* provides valuable and enduring insights into U.S. trade policy past and present.



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