NBER | NATIONAL BUREAU of ECONOMIC RESEARCH

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

Change Service Requested

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

NBER | NATIONAL BUREAU of ECONOMIC RESEARCH

The Reporter

No. 4, 2025

In This Issue

Program Report: Industrial Organization

Liran Einav*

Researchers in the Industrial Organization (IO) Program study consumer and firm behavior, competition, innovation, and government regulation. This report begins with a brief summary of general developments in the last four 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.[1] 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 Tim Bresnahan, Ariel Pakes, and Rob Porter played a key role in advancing this work.[2]

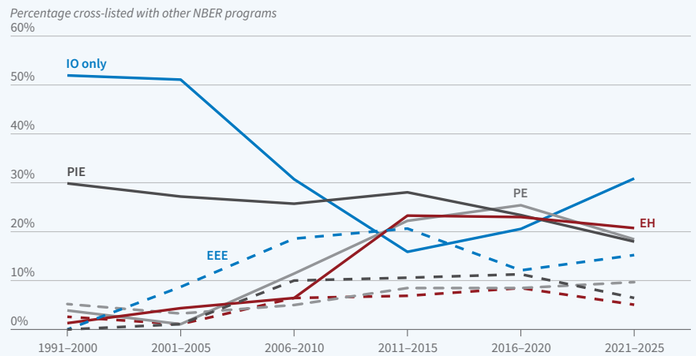
Underlying both approaches was the idea that individual industries are sufficiently distinct and industry details sufficiently important that researchers need to focus on specific markets and industries in order to test particular hypotheses about consumer or firm behavior, or to estimate models that could be used for counterfactual analysis, such as analysis of a merger or regulatory change.

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 Productivity, Innovation, and Entrepreneurship Program, 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.

The last two decades have witnessed two broad trends in expanding the scope of program members' research. One concerns topics: while studies of traditional IO questions around antitrust and competition policy have continued to be a key defining area of inquiry for the field, there has been rapid growth of research by NBER IO scholars on sectors such as health care,[3] education,[4] financial markets,[5] media,[6] and transportation.[7] This type of topical expansion is now colloquially termed "IO+."

Figure 1

IO Program Working Papers, 1991–2025



IO stands for Industrial Organization, PIE for Productivity, Innovation, and Entrepreneurship, PE for Political Economy, EH for Economics of Health, and EEE for Environment and Energy Economics.
Source: Researchers' calculations.

*Liran Einav is the Charles R. Schwab Professor of Economics at Stanford University and has been director of the NBER Industrial Organization program since 2016.

The second trend is more methodological. The empirical work in the 1990s relied heavily on insights from game theory and naturally emphasized structural modeling of demand and supply. This ran somewhat counter to the trend in other applied microeconomic fields at the time, which highlighted natural experiments and causal inference. In the last two decades, we have seen some convergence between empirical IO and other fields of applied microeconomics. Work in other fields is increasingly using "IO-style" econometric modeling, while IO papers increasingly combine (within and across papers) causal inference methods that motivate and complement the subsequent theory-based econometric models.

To illustrate the broadening research activity of industrial organization economists, this summary highlights several specific papers. They have been chosen to underscore the wide spectrum of industries and topics addressed by program members and the variety of approaches and tools being used to study competition and markets. The last section summarizes some more recent IO work on the very active, core IO topics of antitrust and competition policy.

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 on the NBER website's IO program page.

The Digital Economy

Over the last two decades, the digital economy has grown enormously and today it plays a central role in economies around the world. While some segments of the digital economy are highly competitive, there are growing concerns that incumbent firms have established entrenched positions and wield substantial market power. This has led to ongoing antitrust policy action such as the adoption of the Digital Markets Act in Europe and the legal discourse between Google and the US Department of Justice.

The growing size of and policy interest in the digital economy has been a fertile ground for new research. One recent example, which also illustrates the broad set of empirical tools deployed by IO scholars, is the work by Hunt Allcott, Juan Camilo Castillo, Matt Gentzkow, Leon Musolff, and Tobias Salz,[8] which studies the dominance of Google in the internet search engine market.

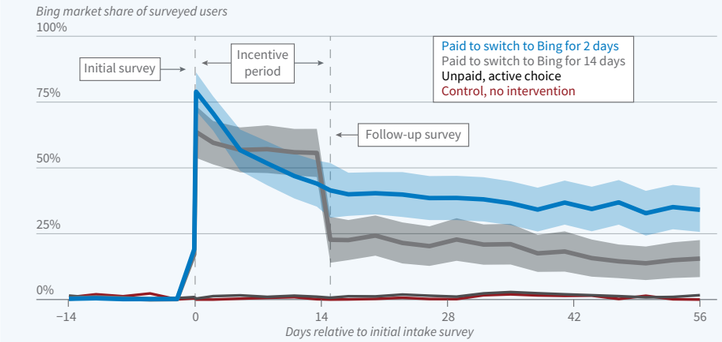
Google has maintained a very stable market share of 80–90 percent, both in the US and worldwide, over the last two decades, and the paper attempts to uncover the determinants of this market dominance. One hypothesis is that Google attracts more users because it is simply better. An alternative is that Google enjoys an advantage due to its status as a default and/or first mover, which in this context may manifest itself by users finding it difficult to switch search engines and/or by users incorrectly perceiving Google to be better because they have had no experience with alternatives (mostly Bing in the US). This question is one of the most foundational in IO: if it is the former then Google's dominance may be an efficient market outcome, while if it is the latter, there might be a case for policy intervention.

To study this question, the researchers ran a randomized experiment and embedded the experimental results in a stylized model of search engine choice to quantify its implications. They recruited approximately 2,300 Google Chrome users, surveyed them at enrollment (day 0) and two weeks later (day 14), tracked their search behavior, and randomized them into several experimental arms. In one arm, users were forced to make an active search engine choice. A second arm incentivized users to switch to Bing for 14 days, after which they would make an active search engine choice. A third arm incentivized users to change the default search engine. The researchers also cross-randomized an arm that used a browser extension to degrade the quality of users' search results on Google.

The experimental results are depicted in Figure 2. Forcing users to make an active choice does not have much of an impact, but many users who were incentivized to switch to Bing for 14 days continued to use Bing even after the 14-day incentivized period had elapsed. The 14-day survey also suggests that, on average, those who used Bing had a more positive view of Bing's quality relative to their day-0 perception.

Figure 2

Search Engine Market Share



Researchers conducted an experiment by surveying 2,300 Google Chrome users for whom Google is the default search engine. Shaded areas represents 95% confidence intervals. Source: "Source of Market Power in Web Search: Evidence from a Field Experiment," Allcott H, Castillo JC, Gentzkow M, Musolff L, Salz T. NBER Working Paper 33410, May 2025.

Embedding these experimental results in a model of search engine choice, the researchers conclude that defaults have a first-order importance in this setting. They estimate that about a third of users are "permanently inattentive," and this prevents them from learning about other search engines. This helps Google retain its market share because users underestimate the quality of competitors.

The researchers use the results to assess possible remedies to Google's high market share. They conclude that active choice screens (as implemented in Europe) do not have much of an impact, but changing defaults could significantly reduce Google's market share. This would benefit some consumers who learn they prefer the alternative, but also hurt many others who prefer Google but would not switch back (once the default changed) due to inattention.

Related work by Michael Ostrovsky[9] studies the auction design for spots on the active choice screens in Europe and shows that the auction to get on the active choice menu would be much more competitive if bids were made on a per-install basis rather than on a per-appearance basis, because the latter places small search engines at a major disadvantage.

Another recent and policy-relevant topic of interest in the digital economy context is the question of "self-preferencing" by digital platforms, as many platforms operate as both a platform and as a seller on the platform. This has led to concerns, for example, about potential Google preferences for its own Google Shopping service when displaying search results, or for Amazon self-preferencing Amazon-owned products in its e-commerce marketplace. Papers by Chiara Farronato, Andrey Fradkin, and Alex MacKay[10] and by Joel Waldfogel[11] present evidence that support this concern by showing that Amazon ranks its own products higher than competitors' comparable products. The latter paper also shows that the European Digital Market Act has decreased, but has not eliminated entirely, this self-preferential treatment.

Transportation Markets

As mentioned above, the last two decades have witnessed the growth of "IO+" work, which recognizes that the current style of empirical IO work has proven useful in studying a range

of markets. Within this overall trend, with the availability of new sources of granular data and the emergence of ride-hailing platforms, transportation markets have gained significant attention from IO scholars in recent years.

One example is a paper by Milena Almagro, Felipe Barbieri, Castillo, Nathaniel Hickok, and Salz,[12] which uses data from the city of Chicago to study urban transportation policy. The paper is motivated by the simple fact that the vast majority of Americans commute by car, leading to both congestion and environmental costs. At the same time, the average bus in Chicago, and presumably in many other cities, is well below capacity. The paper explores the extent to which congestion pricing and/or subsidies and improvements to public transit can be effective.

To study this question, the authors assemble a rich dataset from multiple sources for a single calendar month (January 2020) in Chicago: trip-level public transport (trains and buses) data, trip-level data on the universe of taxi and ride-hailing (Uber and Lyft) trips, and private-car trips based on mobile-phone geolocation data (covering about 40 percent of all devices).

The richness of the data allows the authors to estimate a heterogeneous demand system for modes of transportation,[13] which sheds light on how individuals trade off convenience, money, and time. The model can be used to evaluate possible changes in public transit pricing and frequency, and in private transit congestion fees. The results suggest that there are welfare gains from free public transit as well as from road pricing and congestion fees. The findings emphasize the interaction between these two potential interventions, highlighting the strong complementarities that emerge from municipal budget constraints.

There are many other recent examples of related work. One is a study by Panle Jia Barwick, Shanjun Li, Andrew Waxman, Jing Wu, and Tianli Xia,[14] which uses granular commuting data from Beijing to estimate an equilibrium sorting model and assess various urban transportation policies. A second is the work by Nick Buchholz, Laura Doval, Jakub Kastl, Filip Matějka, and Salz,[15] which uses ride-level price variation from a European ride-hailing platform in which cabs bid for rides in order to back out individuals' value of time. A third example is the work by Giulia Brancaccio, Myrto Kalouptsidi, and Theodore Papageorgiou,[16] which uses granular, geolocation trip-level data on marine shipping to develop and estimate an equilibrium model of world-wide international trade.

Market Power and Competition Policy

In addition to some of these newer trends, the last decade has also witnessed renewed interest in some of the core IO questions around measuring markups and market power and assessing the anticompetitive impact of mergers and acquisitions.

One line of work has been driven by the influential paper of Jan De Loecker, Jan Eeckhout, and Gabriel Unger,[17] which analyzes Compustat data and applies a macro-style, "production function" empirical approach, that finds that average markups in the US economy have been rising over the last four decades. This striking finding has generated a number of follow-on studies. For example, Ali Yurukoglu, Paul Grieco, and Charlie Murry[18] recovered markups in the US auto industry using the more standard IO approach, which relies on inverting the first order condition for optimal pricing. They found that markups in the US auto industry have been, in fact, declining. In contrast, two related papers[19] apply a similar "standard IO" approach to consumer-packaged goods and find that markups have increased due to a combination of lower marginal costs and a decline in consumers' price sensitivity. In a review of recent evidence on the topic,[20] Yurukoglu and Carl Shapiro write that "the economic evidence that looks across many industries over a long period of time does not support the view that there has been a widespread decline in competition in the US economy over the past 25 or 40 years." This remains a subject of lively debate.

The claim that markups are rising has led some to argue that US antitrust policy is too lax. This sentiment, along with recent research on horizontal mergers, contributed to the 2023 revision of the merger guidelines.[21] One example of recent research is Tom Wollmann's study[22] of "stealth consolidation," which shows how firms break down one large merger into a sequence of smaller mergers, all of which fall below the reporting threshold and thereby avoid antitrust scrutiny. Another example is the work of Volker Nocke and Michael Whinston,[23] who develop several quantitative theory exercises that suggest that consumer welfare can be approximated reasonably well by the magnitude of the change in concentration measure regardless of its initial level. A third recent example of research on related issues is a study by Mert Demirer and Omer Karaduman.[24] Using data on thousands of power plant acquisitions in the US, they estimate a 2–5 percent increase in productivity for the average acquisition, providing new evidence about the productivity-enhancing benefits of industry consolidation.

Looking Ahead

This is an exciting time to be carrying out research in industrial organization. The "data revolution" has created many incredible opportunities, including the use of administrative datasets, scalable web scraping, and many collaborations with private companies. The active public discourse around competition policy and "big tech" is a fertile ground for new and impactful work, and the increasing "IO+" research makes it possible for IO scholars to overlap and interact even more than in the past with work and scholars from other fields. NBER IO meetings always cover a vast set of topics and industries and a range of empirical methods, creating many learning opportunities for all of us.

---

[1] "The Theory of Industrial Organization," Tirole J. Cambridge, Massachusetts: The MIT Press, 1988. Return to text

[2] "Entry and Competition in Concentrated Markets," Bresnahan TF, Reiss PC. *Journal of Political Economy* 99(5), 1991, pp. 977–1009.

Automobile Prices in Market Equilibrium, Berry S, Levinsohn J, Pakes A. NBER Working Paper 4264, January 1993, and *Econometrica* 63(4), July 1995, pp. 841–90.

The Role of Information in U.S. Offshore Oil and Gas Lease Auctions, Porter R. NBER Working Paper 4185, October 1992, and *Econometrica* 63(1), January 1995, pp. 1–27.
Return to text

[3] Equilibria in Health Exchanges: Adverse Selection vs. Reclassification Risk, Handel B, Hendel I, Whinston M. NBER Working Paper 19399, September 2013, and *Econometrica* 83(4), July 2015, pp. 1261–1313.

Insurer Competition in Health Care Markets, Ho K, Lee R. NBER Working Paper 19401, November 2016, and *Econometrica* 85(2), March 2017, pp. 379–417.
Return to text

[4] Demand Analysis using Strategic Reports: An application to a school choice mechanism, Agarwal N, Somaini P. NBER Working Paper 20775, October 2017, and *Econometrica* 86(2), March 2018, pp. 391–444.

Heterogenous Beliefs and School Choice Mechanisms, Kapor A, Neilson C, Zimmerman S. NBER Working Paper 25096, December 2019, and *American Economic Review* 110(5), May 2020, pp. 1274–1315.
Return to text

[5] The High-Frequency Trading Arms Race: Frequent Batch Auctions as a Market Design Response, Budish E, Cramton P, Shim J. Presented in the NBER IO Summer 2014 meeting, and *Quarterly Journal of Economics* 130(4), November 2015, pp. 1547–1621.

Bid Shading and Bidder Surplus in the U.S. Treasury Auction System, Hortacsu A, Kastl J, Zhang A. NBER Working Paper 24024, November 2017, and *American Economic Review* 108(1), January 2018, pp. 147–169.
Return to text

[6] What Drives Media Slant? Evidence from U.S. Daily Newspapers, Gentzkow M, Shapiro J. NBER Working Paper 12707, August 2007, and *Econometrica* 78(1), January 2010, pp. 35–71.

The Welfare Effects of Vertical Integration in Multichannel Television Markets, Crawford G, Lee R, Whinston M, Yurukoglu A. NBER Working Paper 21832, April 2017, and *Econometrica* 86(3), May 2018, pp. 891–954.
Return to text

[7] Figure 1 presents an attempt to quantify this topical evolution of the field by updating an earlier figure from our 2017 program report.
Return to text

[8] Sources of Market Power in Web Search: Evidence from a Field Experiment, Allcott H, Castillo JC, Gentzkow M, Musolff L, Salz T. NBER Working Paper 33410, May 2025.
Return to text

[9] Choice Screen Auctions, Ostrovsky M. NBER Working Paper 28091, November 2020, and *American Economic Review* 113(9), September 2023, pp. 2486–2505.
Return to text

[10] Self-Preferencing at Amazon: Evidence from Search Ranking, Farronato C, Fradkin A, MacKay A. NBER Working Paper 30894, January 2023, and *AEA Papers and Proceedings* 113, May 2023, pp. 239–243.
Return to text

[11] Amazon Self-Preferencing in the Shadow of the Digital Market Act, Waldfogel J. NBER Working Paper 32299, April 2024.
Return to text

[12] Optimal Urban Transportation Policy: Evidence from Chicago, Almagro M, Barbieri F, Castillo JC, Hickok N, Salz T. NBER Working Paper 32185, October 2025.
Return to text

[13] It is impossible to not think about the data revolution in this context. One of the more famous empirical applications that motivated Daniel McFadden's Nobel-Prize econometric contributions explored a very similar type of question, but had to rely on a survey of 213 Bay Area commuters ("The Measurement of Urban Travel Demand," McFadden D. *Journal of Public Economics*, 3(4), November 1974, pp. 303–328).
Return to text

[14] Efficiency and Equity Impacts of Urban Transportation Policies with Equilibrium Sorting, Barwick P, Li S, Waxman A, Wu J, Xia T. NBER Working Paper 29012, February 2022, and *American Economic Review* 114(10), October 2024, pp. 3161–3205.
Return to text

[15] Personalized Pricing and the Value of Time: Evidence from Auctioned Cab Rides, Buchholz N, Doval L, Kastl J, Matějka F, Salz T. NBER Working Paper 27087, March 2024, and *Econometrica* 93(3), June 2025, 929–958.
Return to text

[16] Geography, Search Frictions, and Endogenous Trade Costs, Brancaccio G, Kalouptsidi M, Papageorgiou T. NBER Working Paper 23581, October 2018, and *Econometrica* 88(2), March 2020, 657–691.
Return to text

[17] The Rise of Market Power and the Macroeconomic Implications, De Loecker J, Eeckhout J. NBER Working Paper 23687, August 2017. Published with Unger G in the *Quarterly Journal of Economics* 135(2), January 2020, pp. 561–644.
Return to text

[18] The Evolution of Market Power in the US Auto Industry, Grieco P, Murry C, Yurukoglu A. NBER Working Paper 29013, July 2021, and *Quarterly Journal of Economics* 139(2), May 2024, pp. 1201–1253.
Return to text

[19] Scalable Demand and Markups, Atalay E, Frost E, Sorensen A, Sullivan C, Zhu W. NBER Working Paper 31230, May 2023, and forthcoming in the *Journal of Political Economy.*

Rising Markups and the Role of Consumer Preferences, Döpper H, MacKay A, Miller N, Stiebale J. NBER Working Paper 32739, July 2024, and *Journal of Political Economy* 133(8), August 2025, pp. 2462–2505.
Return to text

[20] Trends in Competition in the United States: What Does the Evidence Show?, Shapiro C, Yurukoglu A. NBER Working Paper 32762, August 2024, and forthcoming in the *Journal of Political Economy Microeconomics*.
Return to text

[21] The revised guidelines have benefited from important contributions by NBER IO members, Susan Athey

and Aviv Nevo, who served at the time as chief economists of the Department of Justice and Federal Trade Commission, respectively. Return to text

[22] How to Get Away with Merger: Stealth Consolidation and Its Effects on US Healthcare, Wollmann T. NBER Working Paper 27274, March 2024. Return to text

[23] Concentration Screens for Horizontal Mergers, Nocke V, Whinston M. NBER Working Paper 27533, July 2020, and *American Economic Review* 112(6), June 2022, pp. 1915–1948. Return to text

[24] Do Mergers and Acquisitions Improve Efficiency? Evidence from Power Plants, Demirer M, Karaduman O. NBER Working Paper 32727, July 2024, and forthcoming in the Journal of Political Economy. Return to text

The Industrial Organization (IO) Program 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 119 members, holds a winter meeting on the West Coast, a summer meeting during the NBER Summer Institute, and recently added a third, theme-based small-group meeting each fall.

The Risks and Rewards of Homeownership

Patrick Bayer, Fernando Ferreira, and Stephen Ross

The US government has long promoted homeownership through subsidies and tax incentives, viewing it as both socially beneficial and a primary pathway to individual wealth accumulation. For the middle class—those in roughly the middle three-fifths of the wealth distribution—housing wealth remains the most important source of financial security and net worth. Homeownership is also widely believed to provide access to better neighborhoods and higher-quality schools. Yet despite these advantages, homeownership entails significant risks. Homeowners are exposed to housing market downturns that can rapidly erode equity, as well as to income and employment shocks that can compromise their ability to meet mortgage obligations. Such disruptions can lead to delinquency and, in severe cases, the loss of one's home. Although these downside risks are well recognized, empirical evidence on their long-term magnitude and consequences remains limited.

Our collective research agenda has sought to understand the barriers to homeownership and to quantify the risks that accompany it. Households must weigh numerous factors when deciding whether to buy a home, and there are constraints that may limit the choices of many low-income families. For instance, saving for a mortgage down payment may require substantial sacrifices in current consumption, while also limiting both the size of the home purchased and the quality of the neighborhood. After purchasing a home, even modest declines in local house prices can erode accumulated equity and reduce both wealth and financial flexibility. Employment or income shocks can lead to missed mortgage payments, sharp declines in credit scores, and, in the most severe cases, foreclosure. The potential consequences of foreclosure extend far beyond the immediate loss of housing and equity, damaging credit, constraining access to future borrowing, and undermining long-term financial stability.

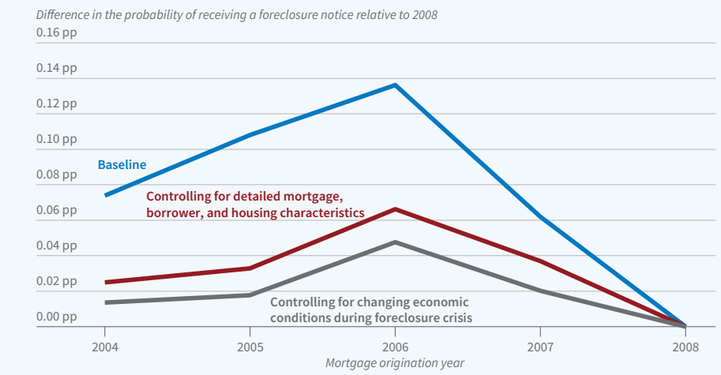
The housing cycle can further amplify homeowner vulnerability during economic downturns. In 2016, we investigated this issue using a large sample of credit data on individual homeowners who purchased or refinanced during the 2000s housing boom.[1] The findings suggest that higher-risk borrowers entered the owner-occupied housing market in greater numbers as credit availability expanded. Borrowers who purchased homes at the 2006 market peak subsequently experienced the highest foreclosure rates. Figure 1 presents estimates of the probability of receiving a foreclosure notice by mortgage origination year, relative to 2008. The top line presents unconditional estimates, the middle line controls for detailed mortgage, borrower, and housing characteristics, and the bottom line further accounts for changing economic conditions during the foreclosure crisis. Notably, foreclosure risk was highest for mortgages originated in 2006. While negative equity, as captured by our controls for economic conditions, explains part of this risk, it accounts for only a small part. The remaining variation largely reflects observable pre-origination borrower risk and unobserved factors that are difficult for lenders to identify or mitigate at origination, such as risk of future job loss.

Our analysis suggests that the worse foreclosure outcomes for those who purchased at the market peak were driven primarily by underlying borrower risk rather than by exposure to negative equity during the downturn. This led us to "call into question the idea of encouraging homeownership as a general mechanism for reducing racial disparities in wealth," noting that "to the extent that increases in homeownership are driven by the entry of especially vulnerable households into the owner-occupied market, such a push may backfire, leaving vulnerable households in a difficult financial situation and adversely affecting their wealth and credit-worthiness for years."

However, these concerns were based on limited evidence about the longer-term effects of income shocks and home loss. In recent work with Heidi Artigue, we examine the long-run consequences of losing one's home during the Great Recession. Building on prior studies, we extend linked mortgage–credit report data to track outcomes through 2022.[2] Our analysis

Figure 1

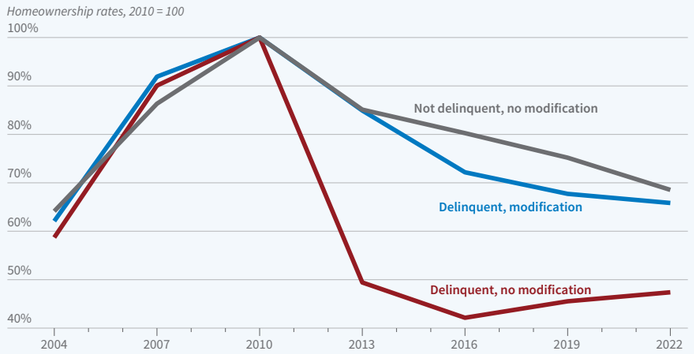
Foreclosure Risk by Mortgage Origination Year



Source: "What Drives Racial and Ethnic Differences in High Cost Mortgages? The Role of High Risk Lenders," Bayer P, Ferreira F, Ross SL. NBER Working Paper 22004, February 2016, and The Review of Financial Studies *31(1), January 2018, pp. 175–205.*

Figure 2

Delinquencies, Mortgage Modifications, and Homeownership Rates



Groups are defined by delinquency in the 24 months preceding June 2010 and by receipt of a mortgage modification by 2013. Source: "Does Homeownership Matter? The Long-Term Consequences of Losing a House during the Great Recession," Artigue H, Bayer P, Ferreira FV, Ross S. NBER Working Paper 33692, October 2025.

focuses on households that experienced severe mortgage delinquencies between 2008 and 2010 as a proxy for those experiencing financial distress due to income shocks. We use receipt of a mortgage modification (i.e., a reduction in payments or balances and a reset of the payment schedule) as the treatment variable. By comparing delinquent borrowers who received a modification with similar borrowers who did not, our design isolates the effect of home loss from the broader effects of income shocks. We validate this approach by demonstrating parallel pre-trends across a wide range of credit outcomes between the two groups.

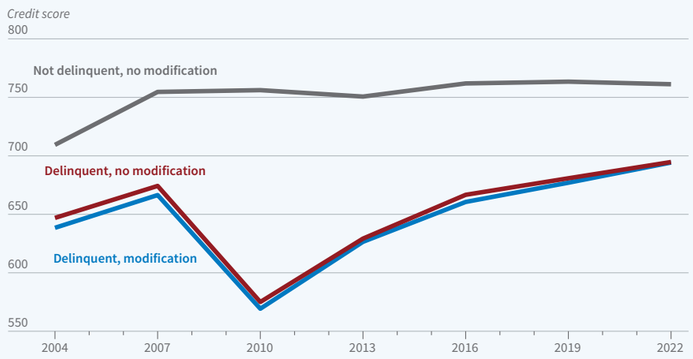
Figure 2 shows that between 2010 and 2013, a 35-percentage-point gap emerged in home retention between borrowers who received a modification and those who did not. Borrowers who received a modification quickly returned to homeownership rates that were similar to those of borrowers who avoided severe delinquency altogether. These differences persisted over the next decade, with an 18-percentage-point gap still present in 2022. Consistent with our earlier speculation, households experiencing significant negative shocks during downturns face a substantial risk of losing their homes and lasting barriers to re-entering homeownership.

Beyond homeownership, however, other long-term financial consequences were less visible than we expected. Figure 3 shows that credit scores for both subsamples followed parallel paths before 2010, declined sharply during the crisis, and recovered by 2022, with minimal differences between the treatment and control groups over the entire period. Figure 4 presents similar evidence for consumption, measured by credit card payments. Both groups experienced significant declines in credit card payments during the recession, bottoming out around 2013 and recovering by 2022. Similar patterns are found for credit card balances, auto loans, and other measures. Thus, households experiencing severe delinquencies largely recovered in both credit and consumption measures, regardless of whether they lost their homes. We also find no long-term differences in neighborhood quality among those who lost homes versus those who retained them.

Figure 5 presents our estimates of changes in housing wealth. On average, delinquent borrowers held about $70,000 in equity in 2007, all of which was lost by 2013 among those who lost their homes. This pattern underscores the substantial risk that negative income shocks pose to homeowners through the erosion of both down payments and accumulated equity. Although part of these losses likely reflect temporary, bubble-driven price gains, the average down payment among homebuyers who later became severely delinquent was $43,000, suggesting that a meaningful share of the lost equity represented real assets contributed at purchase. By 2022, however, housing equity had rebounded substantially: borrowers without a modification held more than $100,000 in equity on average, while those with a modification held close to $200,000. Thus, despite their earlier vulnerability,

Figure 3

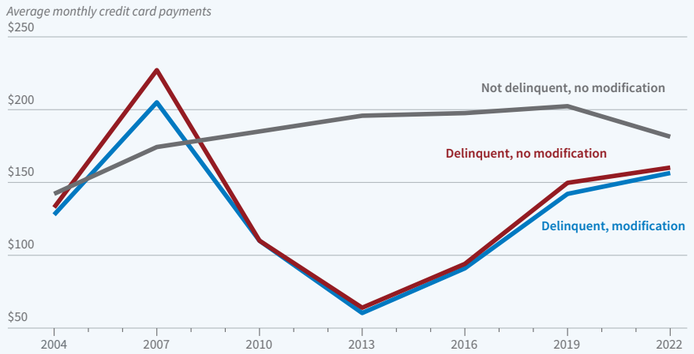
Delinquencies, Mortgage Modifications, and Credit Scores



Groups are defined by delinquency in the 24 months preceding June 2010 and by receipt of a mortgage modification by 2013. Source: "Does Homeownership Matter? The Long-Term Consequences of Losing a House during the Great Recession," Artigue H, Bayer P, Ferreira FV, Ross S. NBER Working Paper 33692, October 2025.

Figure 4

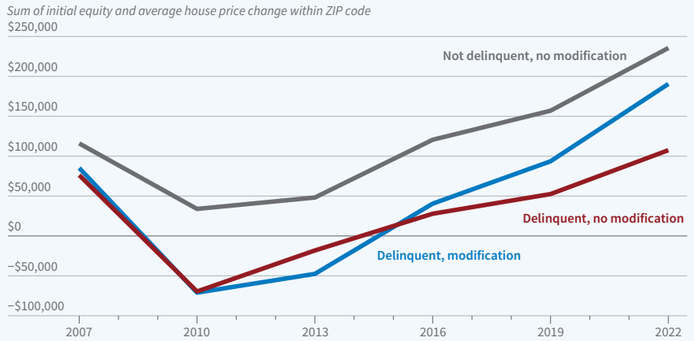
Delinquencies, Mortgage Modifications, and Credit Card Payments



Groups are defined by delinquency in the 24 months preceding June 2010 and by receipt of a mortgage modification by 2013. Source: "Does Homeownership Matter? The Long-Term Consequences of Losing a House during the Great Recession," Artigue H, Bayer P, Ferreira FV, Ross S. NBER Working Paper 33692, October 2025.

Figure 5

Delinquencies, Mortgage Modifications, and Housing Equity



Estimates account for potential home loss and ownership changes in all years later than 2010. Groups are defined by delinquency in the 24 months preceding June 2010 and by receipt of a mortgage modification by 2013. Source: "Does Homeownership Matter? The Long-Term Consequences of Losing a House during the Great Recession,"Artigue H, Bayer P, Ferreira FV, Ross S. NBER Working Paper 33692, October 2025.

these delinquent borrowers were, on average, financially better off in the long run than comparable individuals who never entered homeownership, given the strong recovery in housing prices over the subsequent decade.

Our findings to date offer a nuanced view of the risks and rewards of homeownership during economic downturns. Vulnerable households face substantial short-term risks, including exposure to income shocks, loss of equity, and financial stress, but these losses can be offset by the potential for long-term capital gains. Importantly, even households that lost their homes during the Great Recession did not experience persistent deterioration in broader financial outcomes, suggesting a degree of resilience that tempers the conventional view of homeownership risk.

In current research with Stephanie Grove that has not yet been released, we examine the effects of the post–Great Recession tightening of mortgage credit.[3] Preliminary analysis suggests that this contraction may have contributed to sharply reduced homeownership rates for many individuals in their twenties and thirties, delaying the natural transition into homeownership relative to earlier cohorts. The observed decline in homeownership has been especially pronounced among households in the middle of the income and education distributions (i.e., those with high school rather than college degrees). As a result, many young Americans may have experienced a lasting reduction in wealth accumulation, with significant implications for their long-term economic wellbeing and inequality within and across cohorts.

Taken together, our results underscore the importance of striking a careful balance between expanding access to mortgage credit and maintaining financial stability. Excessive credit restriction can exclude younger and middle-income households from the primary channel of wealth building in the United States, while overly permissive lending can expose vulnerable borrowers to unsustainable risks. Ensuring that mortgage markets remain both accessible and prudent is essential to preserving homeownership as a cornerstone of economic opportunity rather than a source of financial vulnerability.

---

[1] "The Vulnerability of Minority Homeowners in the Housing Boom and Bust," Bayer P, Ferreira FV, Ross SL. NBER Working Paper 19020, February 2015, and *American Economic Journal: Economic Policy* 8(1), February 2016, pp. 1–27. Return to text

[2] "Does Homeownership Matter? The Long-Term Consequences of Losing a House during the Great Recession," Artigue H, Bayer P, Ferreira FV, Ross SL. NBER Working Paper 33692, October 2025. Return to text

[3] "The Lost Homeownership Decade," Bayer P, Ferreira FV, Grove S, Ross, SL. Forthcoming new project. Return to text

Patrick Bayer

Patrick Bayer is the Gilhuly Family Professor of Economics at Duke University and a research associate at the NBER affiliated with the Economics of Education program. His research focuses on racial inequality and segregation, social interactions, discrimination, housing markets, education, and criminal justice, with recent work published in top journals including the *American Economic Review* and *The Quarterly Journal of Economics*. He received a PhD from Stanford University in 1999 and a BA in mathematics from Princeton University in 1994. He is currently working on projects related to the intergenerational consequences of segregation, gentrification, and homeownership.

Fernando V. Ferreira

Fernando V. Ferreira is the CF Koo Professor of Real Estate and Business Economics and Public Policy at The Wharton School of the University of Pennsylvania, where he has been on the faculty since 2004. Ferreira is a research associate at the NBER affiliated with the Public Economics program. He is the chair of the Real Estate Department, and his research interests include real estate, urban economics, and public economics. He received his PhD in economics from the University of California, Berkeley in 2004. He is currently working on projects examining the welfare consequences of federal housing programs, the market impacts of denser housing development around transportation corridors, and the importance of credit markets for housing consumption.

Stephen L. Ross

Stephen L. Ross is a professor of economics at the University of Connecticut and a research associate at the NBER affiliated with the Economics of Education program, specializing in discrimination in housing, mortgage lending and policing, residential and school segregation, neighborhood and peer effects, and the economics of education. He is a coauthor of *The Color of Credit: Mortgage Discrimination, Research Methodology, and Fair-Lending Enforcement* and has published extensively in top journals including the *Journal of Political Economy* and the *Review of Economics and Statistics*. He has served as coeditor at the *American Economic Journal: Economic Policy, Regional Science and Urban Economics, Education Finance and Policy*, and received his PhD in economics from Syracuse University in 1994.

Quantitative Trade Policy in a Changing World

Lorenzo Caliendo and Fernando Parro

Introduction

Over the past three decades trade policy has profoundly shaped the structure of production, employment, and welfare across countries. The North American Free Trade Agreement (NAFTA), China's entry into the World Trade Organization (WTO), and the recent resurgence of tariff protectionism illustrate how deeply globalization and policy choices are intertwined. Evaluating their effects requires quantitative frameworks that capture how shocks to both technology and policy propagate through supply chains, labor markets, and international linkages.

Our research develops tractable general equilibrium models to quantify how shocks such as tariffs affect economies—both in the aggregate and across workers, regions, and sectors. These frameworks extend the Ricardian model of trade to include multiple sectors, heterogeneous productivity and trade elasticities, input-output linkages, spatial labor markets, and dynamic features such as migration, trade imbalances, and uncertainty. Together, they provide a coherent empirical foundation for evaluating contemporary trade policy.

Building Blocks

The foundation of this research agenda lies in the Ricardian model of comparative advantage, extended to a multi-sector, multi-country economic environment with input-output linkages and spatial adjustments. In this framework, countries differ in productivity and face sector-specific trade costs; goods markets are connected through input-output linkages, and trade flows satisfy a gravity equation—larger, more productive, and geographically closer countries trade more intensively.

Our approach has been to turn theoretical and stylized models into empirically disciplined, policy-relevant models. A key methodological innovation is the exact-hat-algebra approach for trade policy analysis, which expresses equilibrium relationships as ratios (or "hats") between counterfactual and observed economies. By conditioning on data—trade shares, input-output matrices, production, and employment—this approach enables counterfactual analysis without separately identifying unobserved structural fundamentals such as sectoral productivities or non-policy trade costs. It has become a cornerstone of applied trade research, simplifying computation while maintaining internal consistency between data, parameters, and equilibrium economic outcomes. Over time, researchers have expanded it to include geography, dynamic adjustment, uncertainty, and international asset trade. These extensions now make it possible to study a wide range of issues, including migration policy, place-based policy, and climate policy.

NAFTA and the Central Role of Production Linkages

One of our first studies quantified the effects of tariff reductions between 1993 and 2005 across NAFTA members.[1] One key finding is that NAFTA created a tightly integrated regional value chain among its members. To capture this phenomenon, we embedded input-output linkages into a Ricardian trade model, which allows us to trace how policy shocks cascade through production networks within and across countries. For example, a tariff protecting the steel industry raises costs for autos and machinery, reshaping demand and employment well beyond the targeted sector.

By exploiting tariff variation across sectors and trade partners, we also estimated sectoral trade elasticities from trade policy data. With these estimates and applying the model, we found that NAFTA increased intra-bloc trade by 118 percent for Mexico, 41 percent for the United States, and 11 percent for Canada. Welfare rose by 1.3 percent in Mexico, 0.08 percent in the US, and fell slightly by 0.06 percent in Canada. Ignoring intermediate inputs or sectoral linkages reduces estimated effects by more than half. The lesson: trade policy cannot be understood solely through final goods—it operates through a complex network of inter-industry connections.

The China Shock and Uneven Adjustment Across Space and Time

China's WTO accession in 2001 transformed global trade. In research with Maximiliano Dvorkin, we developed a dynamic spatial model linking aggregate trade shocks to regional labor markets through migration and production networks, integrating labor dynamics, trade, and spatial transition paths.[2] This framework allows us not only to measure differential impacts across labor markets but also to estimate aggregate (level) effects, thereby confronting the "missing intercept" problem common in earlier approaches.

To implement this approach, we introduced dynamic hat algebra, an extension of the static "hat" method to intertemporal settings. It expresses changes in endogenous variables as ratios over time, conditional on observed equilibrium paths, allowing researchers to study dynamic adjustment with forward-looking agents—without initially restricting the economy to a steady state, without estimating all structural fundamentals, and without relying on first-order approximations to conduct counterfactual analysis.

Our results show that the China shock accounted for roughly 16 percent of the decline in US manufacturing employment between 2000 and 2007, about 550,000 jobs, while increasing aggregate US welfare by about 0.2 percent. Adjustment was gradual and costly: mobility frictions produced highly uneven effects across workers and regions. Even in a flexible labor mar-

ket like that in the United States, trade openness delivers aggregate gains but imposes concentrated, long-lasting costs and results in spatial inequality when labor mobility is imperfect.

The Trade War and Its Geographical Impact

After the US-China trade war began in 2018, we applied this framework to quantify the impact of tariffs and retaliation across US labor markets.[3] We asked how the effects of the trade war differed from those of the China shock.

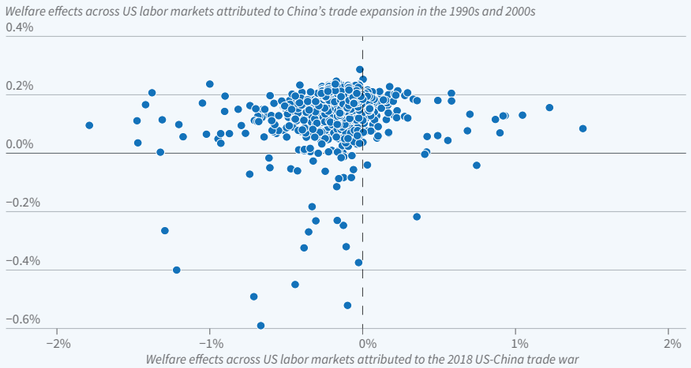
It might seem that the trade war reversed the China shock, but this is not what we found. Figure 1 presents, for each labor market in the US, the effects of the China shock (on the y-axis) and the effects of the trade war (on the x-axis). As we can see in the figure, only four labor markets that lost with the China shock experienced welfare gains with the trade war: the nonmetallic industry in Louisiana, the metal industry in Maine, the wood and paper industry in New Mexico, and the transport equipment industry in West Virginia.

More broadly, manufacturing-intensive regions in the Midwest and Great Lakes suffered losses exceeding 0.6 percent, coastal and service-oriented areas experienced smaller declines (less than 0.2 percent), and more isolated regions were largely unaffected.

The trade war thus reduced real income but did little to restore manufacturing employment. Its effects propagated spatially through input-output linkages, triggering global reallocations along value chains rather than isolating national economies. The lesson: trade wars redistribute losses, not production. Tariffs designed to protect domestic industries can erode real incomes in the very regions they are meant to help—in particular, when other countries retaliate.

Figure 1

The China Shock and Welfare Across US Labor Markets



Source: "Lessons from US-China Trade Relations," Caliendo L, Parro F. NBER Working Paper 30335, August 2022, and Annual Review of Economics *15, September 2023, pp. 513–547.*

The Principle of Reciprocity and Labor-Market Adjustments

In the context of globalization and trade policy, one of the WTO's core principles is reciprocity—the notion that negotiated concessions should be mutually balanced. In ongoing work with Chad Bown, Robert Staiger, and Alan Sykes, we formalize reciprocity within new quantitative trade models, provide formulas for reciprocal tariff changes, and examine how it shapes labor-market adjustments.[4]

Reciprocal tariff reductions preserve each country's terms of trade. When reciprocity holds, domestic tariff changes alone suffice to predict labor-market reallocation, since partner responses offset external price effects. Applying reciprocity to China's WTO accession, we find that China's tariff cuts exceeded the reciprocal benchmark, amplifying labor adjustments in trading partners but increasing global real income overall.

Tariffs, Imbalances, and Uncertainty

Recent developments have raised questions about the role of trade policy in shaping trade imbalances and their equilibrium implications. In research with Samuel Kortum, we integrate trade in goods and assets to study how tariffs interact with trade imbalances and uncertainty.[5] We extend the hat-algebra methodology to a stochastic dynamic setting and find that higher US tariffs narrow the trade deficit through adjustments in income and expenditure but raise domestic prices and lower real consumption. Surplus countries offset some losses through asset trade, illustrating how trade and financial integration jointly shape macroeconomic responses. Attempts to manipulate trade balances through tariffs are therefore costly to consumers.

Conclusion

Across these studies, several consistent insights emerge. First, tariffs propagate broadly. Protection of one sector raises costs in others through supply-chain linkages, often offsetting gains in the targeted industries. Since production linkages amplify trade policy effects, ignoring intermediate inputs or sectoral connections understates welfare and employment impacts. Second, consumers bear much of the burden of higher tariffs. Limited substitution means most price increases pass through to domestic buyers. Third, regional effects are unequal. Areas that specialize in export-oriented manufacturing or are dependent on imported intermediates experience larger declines in real wages and employment. As a result, trade openness yields aggregate gains but uneven outcomes. Fourth, economic adjustment is slow. Labor and production reallocation unfold gradually, amplifying short-term disruptions. The China shock and trade war highlight the importance of accounting for adjustment and distributional dynamics. Fifth, tariffs affect macroeconomic adjustment through general equilibrium effects. They alter relative prices, consumption, and asset flows, not just trade balances.

The global trading system is once again in flux. Supply-chain reorganization, rising uncertainty, and geopolitical tensions pose new challenges for open economies. New quantitative trade models for trade policy—anchored in data and grounded in theory—remain essential for transparent policy evaluation. They enable economists and policymakers to assess not only whether trade policy matters, but how much, for whom, and through which channels. From NAFTA to the China shock and the trade war, the lesson is clear: rigorous quantitative tools are indispensable for designing policies that balance efficiency, equity, and resilience in a changing world.

---

[1] "Estimates of the Trade and Welfare Effects of NAFTA," Caliendo L, Parro F. NBER Working Paper 18508, December 2014, and *The Review of Economic Studies* 82(1), January 2015, pp. 1–4.
Return to text

[2] "The Impact of Trade on Labor Market Dynamics," Caliendo L, Dvorkin M, Parro F. NBER Working Paper 21149, May 2015. Published as "Trade and Labor Market Dynamics: General Equilibrium Analysis of the China Trade Shock" in *Econometrica* 87(3), May 2019, pp. 741–835.
Return to text

[3] "Lessons from US-China Trade Relations," Caliendo L, Parro F. NBER Working Paper 30335, August 2022, and *Annual Review of Economics* 15, September 2023, pp. 513–547.
Return to text

[4] "Reciprocity and the China Shock," Bown CP, Caliendo L, Parro F, Staiger RW, Sykes AO. NBER Working Paper 32835, August 2024.
Return to text

[5] "Tariffs and Trade Deficits," Caliendo L, Kortum SS, Parro F. NBER Working Paper 34003, August 2025.
Return to text

Fernando Parro

Fernando Parro is a professor of economics at the University of Rochester and a research associate at the NBER affiliated with the International Trade and Investment program. He also serves as an associate editor at the *Economic Journal* and senior associate editor at *Economics Letters*. His research focuses on international trade and spatial economics, including the determinants and welfare effects of commercial and migration policies, distributional consequences of trade, and labor market adjustments, with publications in top journals including *Econometrica*, the *Journal of Political Economy*, and the *Review of Economic Studies*. He received his PhD in economics from the University of Chicago and previously held positions at Pennsylvania State University as professor of economics, Princeton University as a Peter B. Kenen Fellow, Johns Hopkins SAIS as an assistant professor, and the Federal Reserve Board as a senior economist.

Lorenzo Caliendo

Lorenzo Caliendo is the Won Park Hahn Professor of Global Affairs and Management and Professor of Economics at Yale University, with appointments at the School of Management and the Jackson School of Global Affairs. His research in international trade focuses on the determinants and welfare effects of commercial and migration policy, how foreign trade competition affects firm organizational and wage structures, and the role of sectoral and regional linkages in aggregate economic activity, with publications in top journals including *Econometrica*, the *Journal of Political Economy*, and *The Quarterly Journal of Economics*. He is a research associate at the NBER affiliated with the International Trade and Investment program, holds a PhD in Economics from the University of Chicago, and has received two Uruguayan national prizes in economics.

The Economics of Medicaid: New Evidence on Privatization, Competition, and Program Design

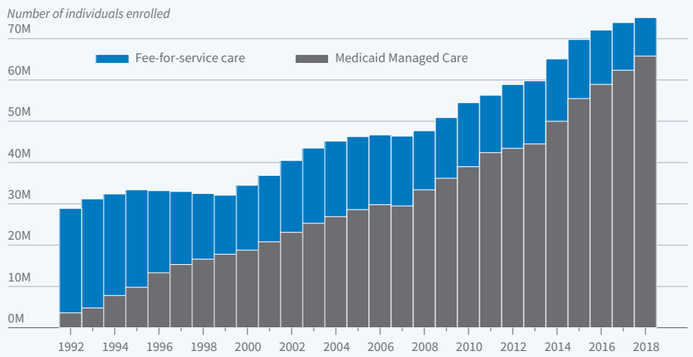
Timothy J. Layton, Nicole Maestas, and Mark Shepard

Medicaid has evolved from a small safety-net program into the largest health insurer in the United States, covering almost 80 million Americans at a combined federal and state cost of $919 billion in 2024.[1,2]

This growth has been accompanied by a structural shift. Unlike Medicare, which is a uniform national program, Medicaid is effectively 50-plus programs designed and administered by each state. Furthermore, it has transformed from a system of government-run fee-for-service (FFS) insurance to one dominated by contracted private "managed care" insurers. Today, roughly 75 percent of all Medicaid beneficiaries are enrolled in private Medicaid Managed Care (MMC) plans (Figure 1).[3]

Figure 1

Medicaid Enrollment in Fee-for-Service and Managed Care



Source: "What Difference Does a Health Plan Make? Evidence from Random Plan Assignment in Medicaid," Geruso M, Layton TJ, Wallace J. NBER Working Paper 27762, October 2021, and American Economic Journal: Applied Economics *15(3), July 2023, pp. 341–79.*

While a significant body of research has focused on the important question of whether Medicaid coverage improves health, our recent research has focused on "inside-the-program" economics. We investigate how this hybrid public-private, federal-state design drives program costs, efficiency, and beneficiary outcomes.

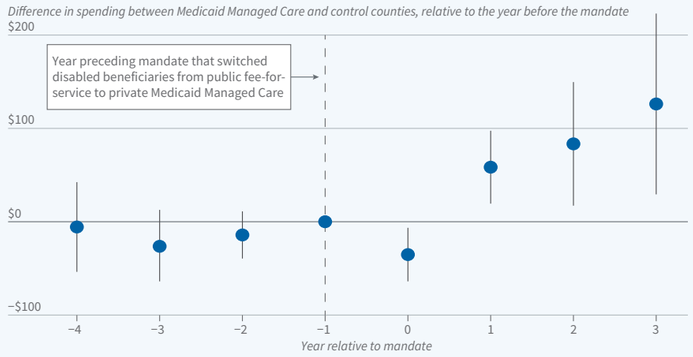
The Public-versus-Private Trade-off in Medicaid

A classic question in public economics is whether governments should deliver services directly or contract them out to private firms. This choice is also fundamental in Medicaid. While states once relied mainly on their own FFS programs to cover medical costs, most states now rely on private MMC plans.

While states often turn to privatization for cost savings and budget predictability, our research reveals a complex and heterogeneous set of trade-offs. As in prior work, we and others find mixed evidence on cost and quality impacts, which vary by state.[4] Our results suggest there is no one-size-fits-all finding for whether public or private Medicaid plans perform better; instead, implementation details and context are central.

Figure 2

Medicaid Spending per Beneficiary per Month



Bars represent 95% confidence intervals.
Source: "The Dynamic Fiscal Costs of Outsourcing Health Insurance - Evidence from Medicaid," Layton T, Politzer E. NBER Working Paper 33302, December 2024, and Journal of Public Economics *247, July 2025, Article 105417.*

The Dynamic Costs of Outsourcing

In a national study, we investigated the fiscal effects of county-level mandates that switched disabled beneficiaries—one of the most expensive populations—from public FFS to private MMC.[5] We found that while privatization was associated with a small cost decrease in the first year, fiscal costs rose faster in the following years. By the fourth year, counties that implemented privatization had program costs that were 9.8 percent higher than control counties (Figure 2).

We find that a central reason costs rise more quickly is the way in which states set payments to managed care plans under federal "actuarial soundness" rules. In practice, state actuaries review recent spending and use those amounts—adjusted for expected inflation—to determine the next year's payment rates. This creates a feedback loop: higher spending today leads to higher payments tomorrow, while savings today often translate into lower payments in the future. This is a dynamic version of classic "cost-plus" contracting incentives, and it tends to raise costs. Over time, this force weakens cost-control incentives for private insurers and allows small spending increases to compound.

We explore alternative ways to set payments to managed care plans, including "yardstick" competition that bases prices on the costs of other firms in the market, and conclude that the specific mechanics of price setting matter and can limit the government's ability to achieve savings through managed care.

Heterogeneity in Quality and Cost

If privatization can increase costs, what are beneficiaries getting in return? Our findings suggest the answer depends critically on the design of the public program being replaced and the health of the population being moved. There is evidence on this question from three states: Texas, Louisiana, and California.

Texas shifted from a FFS program to mandatory privatization for adults with disabilities. We found that the public FFS program used blunt rationing tools to manage costs, most notably a strict cap of three prescriptions per enrollee per month.[6] The state relaxed this rationing with the transition to managed care, leading to significant increases in the use of high-value medications such as insulins, anti-psychotics, and anti-depressants. This, in turn, improved health outcomes: the increased drug use was associated with a *decrease* in avoidable hospitalizations for conditions like diabetes and mental illness. This improvement in quality, however, came with a 12 percent increase in spending. In this context, privatization functioned as a political-economy mechanism to increase spending and relax rationing of high-value medications: Policymakers were more willing to expand Medicaid generosity and spending when the marginal dollars were allocated by private plans instead of government bureaucrats.

In contrast, recent evidence from Louisiana using random assignment of nearly 100,000 beneficiaries to either FFS or MMC shows a different story.[7] Here, MMC *reduced* costs by 5.6 percent. The savings were concentrated in prescription drugs, driven by cost-effective substitutions to generic drugs and lower prices for outpatient care. However, these savings were associated with *decreased* enrollee satisfaction—enrollees in MMC were nearly three times as likely to switch plans—and *decreased* access to primary care, which led to a 14 percent increase in avoidable emergency department (ED) visits.

Other researchers have studied California's managed care mandate for the disabled Medicaid population. In contrast to our Texas results, it appears that the mandate was associated with significant disruptions in care, including increases in ED use and hospital transfers.[8] The study estimated an approximately 12 percent increase in mortality for this population, an effect concentrated among the sickest individuals.

Together, these studies show that the impact of privatization is not uniform. It is highly heterogeneous, depending on how well the state's public FFS program works and on which population is being transitioned.

Competition and Incentives within Managed Care

Given that most Medicaid beneficiaries are now in MMC plans, our research also examines the "black box" of this private market. We show how the *design* of competition and insurer payment systems creates powerful incentives that shape the *de facto* bundle of care.

Competition in a Market with No Consumer Prices

Medicaid competition is unique because enrollees pay zero premiums for all plans. This eliminates price competition and forces plans to compete on non-price features, such as provider networks and access to care. To understand the implications, we used data from New York City, where beneficiaries were randomly assigned to one of ten competing MMC plans.[9]

We found substantial variation between plans: for an identical beneficiary, the lowest-spending plan generated 30 percent lower healthcare spending than the highest-spending plan. This difference was driven almost entirely by variations in the quantity of services provided, not by the prices plans paid. Low-spending plans were not simply more "efficient"; they achieved savings by bluntly reducing both low-value and high-value care, and their enrollees experienced a higher rate of avoidable hospitalizations.

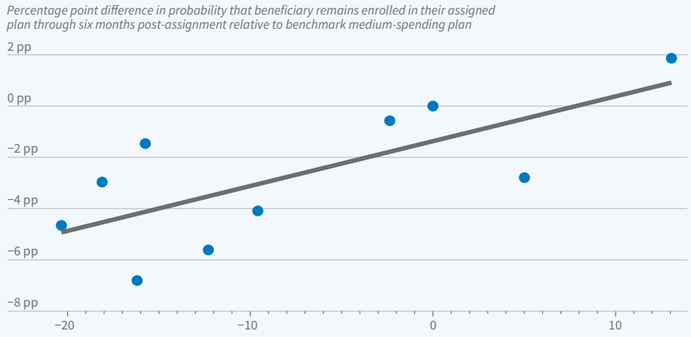
Beneficiaries voted with their feet. Enrollees randomly assigned to high-spending plans were significantly more satisfied and more likely to stay with their plan over time (Figure 3). Enrollees who actively chose a plan—the group most responsive to market dynamics—systematically sorted into the higher-spending, higher-access plans. In a market where plans cannot compete on price, competition on access and quality can actively drive costs up, since enrollees have little incentive to choose lower-cost plans.

Network Design and Adverse Selection

Medicaid competition can also create powerful incentives for

Figure 3

Consumer Satisfaction and Medicaid Plan Healthcare Spending



Source: "What Difference Does a Health Plan Make? Evidence from Random Plan Assignment in Medicaid," Geruso M, Layton TJ, Wallace J. NBER Working Paper 27762, October 2021, and American Economic Journal: Applied Economics *15(3), July 2023, pp. 341–79.*

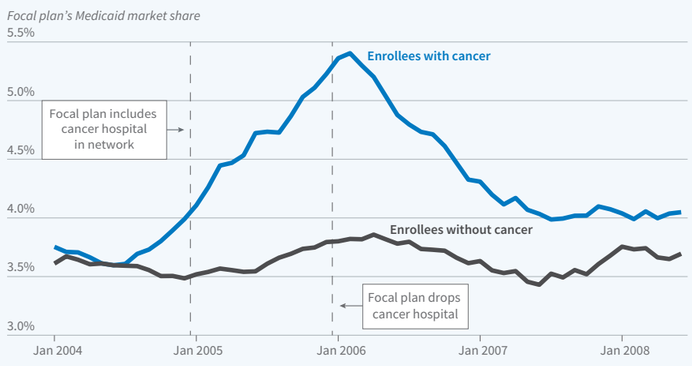
"cream-skimming" (attracting low-cost enrollees) and "skimping" on care demanded by high-cost enrollees. We studied this in a natural experiment where one MMC plan in New York State became the only plan in its market to add a world-renowned specialty cancer hospital to its network.[10]

This decision triggered immediate and severe adverse selection. The plan's market share among enrollees with cancer spiked by 50 percent, while its market share among enrollees without cancer remained flat (Figure 4). The plan disproportionately attracted enrollees with the most severe and costly conditions, such as metastatic cancer.

In a standard market, the plan could raise its premium to cover these new costs. But in Medicaid's fixed-price, administered-payment system, the plan had no way to offset the losses. The plan's response was swift and rational: it dropped the hospital from its network just one year later. This demonstrates how selection incentives in a fixed-price market can punish plans for improving quality on dimensions valued by the sickest enrollees, leading to a "race to the bottom" in network adequacy for specialty care.

Figure 4

Hospital Network and Medicaid Enrollment



Source: "Adverse Selection and Network Design Under Regulated Plan Prices: Evidence from Medicaid," Kreider AR, Layton TJ, Shepard M, Wallace J. NBER Working Paper 30719, December 2022, and Journal of Health Economics *97, September 2024, Article 102901.*

This competition is also occurring in a rapidly consolidating market. In a separate study, we found that between 2006 and 2020, the number of "parent" firms in MMC decreased by 25 percent, while total enrollment tripled.[11] The market is now dominated by a few large, national, for-profit firms.

Program Design and Productivity

Finally, our research explores how Medicaid's high-level design choices—its low provider payments and its state-level flexibility—compare with Medicare and lead to variation in productivity across different types of public health insurance.

Causal Effects of Medicaid vs. Medicare

We leverage a natural experiment to provide new evidence on the cost differences between Medicare and Medicaid. To do so, we examined what happens when people enrolled in Medicaid turn 65 and transition to having Medicare as their primary insurer, with Medicaid providing secondary coverage. We found that total government spending for the same individual jumps by 13 percent at the age 65 threshold.[12]

This cost increase is largely driven by the higher prices that Medicare pays providers for the same services. There is also a shift in the composition of care under Medicare, with greater use of outpatient and lower use of inpatient care. This finding is bolstered by a related study that also examines the age-65 transition.[13] They find that outpatient care utilization increases by about 20 percent upon entering Medicare, and that most of this increase in office visits is explained by physicians' aversion to accepting Medicaid patients.

Taken together, these findings suggest that while Medicaid's low provider payment rates are an effective tool for controlling costs relative to Medicare, this comes at the cost of limiting access. Indeed, we find the transition to Medicare is associated with a beneficial shift for enrollees in the composition of care: more outpatient visits and fewer acute ED visits. The mechanism appears to be that Medicare's higher prices lead to a broader provider network and better access, which in turn leads to higher utilization.

Medicaid State-Level Productivity

Medicaid's design gives states enormous flexibility in program administration. This flexibility is intended to allow states to experiment, generating novel evidence on what works in state-level "laboratories for democracy." But this raises a key question: Does this flexibility lead to efficient, tailored programs—or just wide variation in spending?

To separate the effect of state programs from the health of state residents, we used a "movers" design, tracking dual-eligible beneficiaries (people enrolled in both Medicare and Medicaid) who move from one state to another.[14] This allows us to isolate causal "state effects" (the program) from "person effects" (the enrollee's health).

We found that state-level choices are a dominant driver of spending. Approximately 60 to 70 percent of the cross-state variation in Medicaid spending on duals is due to the state's program design, not to differences in the underlying population. However, when we measured "productivity" by comparing these causal spending effects (inputs) to causal output effects (such as utilization of long-term care), we found only a weak positive relationship.

This suggests that states have large differences in their "productivity"—that is, how effectively they convert program dollars into healthcare services for beneficiaries. More research is needed to understand whether these results apply to other Medicaid populations, which policies matter most for this productivity, and whether states are actively learning from each other to improve program outcomes.

Conclusion

Our research shows that the economics of the Medicaid program are complex and defined by a series of difficult trade-offs. The program's evolution into a massive, privatized, and decentralized system has created a unique set of economic forces. Outsourcing to private plans is not a panacea for cost control; its effects are highly heterogeneous, depending on the public plan it replaces and the population it serves. In some settings, privatization can even lead to dynamic cost increases and worse medical outcomes.

Competition within the private Medicaid segment differs greatly from textbook economic markets. Because they do not charge beneficiaries, plans compete entirely on provider network access. They are strongly influenced by adverse selection that pushes them to exclude benefits, such as access to top cancer hospitals, that are used by the sickest people. While Medicaid's design keeps it lower-cost than Medicare, this is achieved largely through low provider payments that appear to limit access to physician care and drive up ED utilization. The flexibility granted to states has produced a program marked by enormous, policy-driven differences in spending and productivity.

---

[1] "Medicaid Enrollment and Unwinding Tracker," KFF, November 18, 2025.
Return to text

[2] "Federal and State Share of Medicaid Spending," KFF.
Return to text

[3] "10 Things to Know About Medicaid Managed Care," Hinton E, Raphael J. KFF, February 27, 2025.
Return to text

[4] "Has the Shift to Managed Care Reduced Medicaid Expenditures? Evidence from State and Local-Level Mandates," Duggan M, Hayford T. *Journal of Policy Analysis and Management* 32(3), Summer 2013, pp. 505–535.
Return to text

[5] "The Dynamic Fiscal Costs of Outsourcing Health Insurance - Evidence from Medicaid," Layton T, Politzer E. NBER Working Paper 33302, December 2024, and *Journal of Public Economics* 247, July 2025, Article 105417.
Return to text

[6] "Private vs. Public Provision of Social Insurance: Evidence from Medicaid," Layton TJ, Maestas N, Prinz D, Vabson B. NBER Working Paper 26042, July 2019.
Return to text

[7] "The Private Provision of Public Services: Evidence from Random Assignment in Medicaid," Macambira DA, Geruso M, Lollo A, Ndumele CD, Wallace J. NBER Working Paper 30390, January 2025.
Return to text

[8] "Heterogeneity in the Impact of Privatizing Social Health Insurance: Evidence from California's Medicaid Program," Duggan M, Garthwaite C, Wang AY. NBER Working Paper 28944, June 2021.
Return to text

[9] "What Difference Does a Health Plan Make? Evidence from Random Plan Assignment in Medicaid," Geruso M, Layton TJ, Wallace J. NBER Working Paper 27762, October 2021, and *American Economic Journal: Applied Economics* 15(3), July 2023, pp. 341–379.
Return to text

[10] "Adverse Selection and Network Design Under Regulated Plan Prices: Evidence from Medicaid," Kreider AR, Layton TJ, Shepard M, Wallace J. NBER Working Paper 30719, December 2022, and *Journal of Health Economics* 97, September 2024, Article 102901.
Return to text

[11] "Medicaid Managed Care: Substantial Shifts in Market Landscape and Acquisitions, 2006–20," Li B, Layton TJ. *Health Affairs* 44(7), July 2025, pp. 862–868.
Return to text

[12] "Medicaid vs Medicare: Evidence from Medicaid to Medicare Transitions at 65," Layton T, Maestas N, Prinz D, Shepard M, Vabson B. NBER Center Paper NB20-15, February 2024.
Return to text

[13] "Are Medicaid and Medicare Patients Treated Equally?" Ackley C, Dunn A, Liebman E, Shapiro

AH. Federal Reserve Bank of San Francisco Working Paper Series, March 2025.
Return to text

[14] "Estimating Variation in Productivity Across State Medicaid Programs: Evidence from Dual-Eligibles," Layton T, Maestas N, Prinz D, Shepard M, Vabson B. NBER Center Paper NB19-24, October 2024.
Return to text

Timothy Layton

Timothy Layton is an associate professor of public policy and economics at the Frank Batten School of Leadership and Public Policy at the University of Virginia and a research associate at the NBER affiliated with the Economics of Health and Economics of Aging programs. His research focuses on the economics of health insurance markets, particularly for low-income households, with expertise in adverse selection, policy tools to correct market distortions, and the design of social insurance programs like Medicaid and Medicare. He has published in top journals including the *American Economic Review* and the *Journal of Political Economy*, won numerous awards including the Willard Manning Memorial Award, and serves as coeditor of the *Journal of Health Economics*. He received his PhD from Boston University and previously served as associate professor at Harvard Medical School.

Mark Shepard

Mark Shepard is an associate professor of public policy at Harvard Kennedy School of Government and a faculty research fellow at the NBER affiliated with the Economics of Health and Economics of Aging programs. His research focuses on healthcare markets at the intersection of health economics, industrial organization, and public economics, with particular focus on competition and policy design in health insurance markets including the ACA exchanges and Medicaid Managed Care. He received his PhD in economics from Harvard University in 2015 and his AB in applied math from Harvard in 2008.

Nicole Maestas

Nicole Maestas is the John D. MacArthur Professor of Economics and Health Care Policy and chair of the Department of Health Care Policy at Harvard Medical School. She is a research associate at the NBER where she formerly directed the NBER's Retirement and Disability Research Center. She is affiliated with the Economics of Health, Economics of Aging, and Labor Studies programs. Her research focuses on the economics of healthcare systems, disability insurance, labor markets, and population aging, examining topics such as Medicaid and Medicare policies, the opioid epidemic, mental healthcare access, work capacity among people with disabilities and older individuals, and the effects of population aging on economic growth. She received her MPP and PhD in economics from the University of California, Berkeley.

Child Wellbeing: Understanding the Role of Social Investments

Monica Deza, Johanna Catherine Maclean, and Alberto Ortega

Introduction

Childhood, which we define as the period from birth to age 18, is widely recognized as a pivotal period for human development over the life course. During this stage of development, children's bodies and brains grow and evolve, responding to their environment and experiences. Investments during childhood can persistently shape life course outcomes as this stage is characterized by "critical" developmental periods. If a developmental milestone is not met by a specific age, then the child may "miss out" as investments experienced in later stages are less effective and cannot "make up" for lost ground earlier in life. Moreover, many chronic health conditions emerge during childhood and early treatment can improve wellbeing in both the short and long run. For example, the onset of many major mental health and substance use disorders (MHSUD) occur during childhood. Given the high rates of MHSUD among children and costs associated with these conditions within the US, understanding how to address MHSUDs early in life could have sustained and meaningful long-term benefits for both the people experiencing these conditions and society. Moreover, educational accumulation begins during childhood: children who perform well in school and develop solid learning and social skills are well positioned to obtain additional education and secure good jobs in the future, while children who do not gain these capacities face disadvantage as they enter adulthood and beyond.

Given the importance of childhood, substantial attention within the policy and academic spheres, and the general public, is placed on improving outcomes for children. Policymakers have adopted legislation to support children through health and education programs, and researchers—both within economics and across a broad range of disciplines—study how these programs, and other forces, shape child development. Our research examines how insurance, healthcare, and education interact with child wellbeing. More specifically, in a series of studies we have explored the impact of 1) state-level social insurance programs, 2) healthcare supply—with particular focus on MHSUD treatment, and 3) educational inputs on measures of child wellbeing. This review summarizes key findings from our work.

Social Insurance

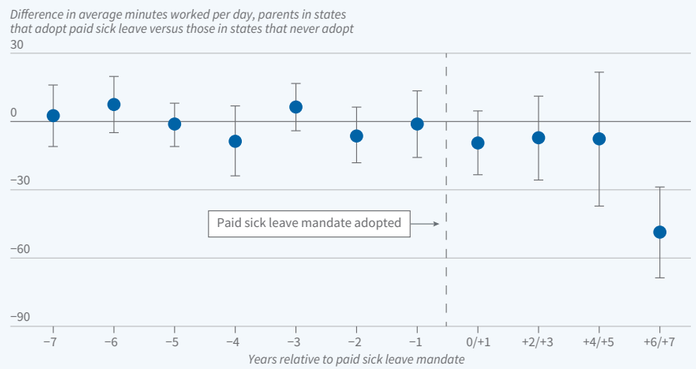
Social insurance programs are designed to protect individuals against risks. These programs are key components of the social safety net and can support child development through in-kind income transfers to families, health insurance access, and so forth. In this line of research, we have examined how two forms of social insurance—paid sick leave (PSL) and public and commercial health insurance—shape child outcomes.

The US, unlike most developed nations, lacks a federal PSL policy. States have adopted PSL mandates which require employers to provide employees with, on average, seven days of PSL per year. Leave can be used for health and healthcare for the employee and their dependents—including children. All state PSL mandates include "safe time" provisions which allow employees to use leave to reduce exposure to violence (e.g., filing police reports and attending court proceedings). A lack of PSL can create tension between the dual responsibilities of work and childcare for parents and mandated PSL can relax some of these conflicts. In several studies, we have examined the impact of state PSL mandates on children's outcomes and our findings suggest that these programs are supporting parental investments in children, reducing children's exposure to domestic violence and maltreatment, allowing families to better time childbirth, and improving access to mental healthcare among children.

Using data from the American Time Use Survey, we show that parents with minor children in the household spend more time on childcare following a state PSL mandate.[1] In particular, parents' provision of primary care (e.g., bathing and feeding children) increases by 6 percent post-mandate, with effects being driven by women with younger children. Parents also increase their total time with children by 3 percent post-mandate. Analyzing administrative data on reports of maltreatment to Child Protective Services (CPS), we find that maltreatment

Figure 1

Paid Sick Leave Policies and Time Dedicated to Work



Thin bars represent 95% confidence intervals.
Source: "The Effects of State Paid Sick Leave Mandates on Parental Childcare Time," Maclean JC, Pabilonia SW. NBER Working Paper 32710, April 2025.

reports decline by 8 percent following a state PSL mandate adoption.[2] Mandated PSL leads to an increase in the probability of reporting one's health as good, very good, or excellent by 1 percent, and a 7 percent decrease in the number of days with bad mental health among parents. Further, we show that intimate partner violence declines by 10 percent post-mandate. Thus, PSL mandates, potentially by improving parents' health and their ability to execute their roles as caregivers, protect children from experiencing maltreatment, and these mandates may allow parents to leave unsafe domestic relationships that could expose children to maltreatment. While not a direct analysis of children, our study of the effects of PSL mandates on birth outcomes among women of childbearing age shows that, following mandate adoption, there is a 3 percent reduction in the birth rate.[3] Our analysis of mechanisms suggests that PSL mandates allow women to use contraception and support employment among women. The ability to better time pregnancies, for example, delaying childbirth until the family has accumulated financial resources, and increase labor market earnings may allow parents to more optimally invest in their children.

Finally, we test the extent to which PSL mandates may alter patterns of mental healthcare utilization among children.[4] We use all-payer health insurance claims data and our findings suggest that PSL mandates impact whether children use any mental healthcare and the type of care they receive. Following a PSL mandate, the probability that children use any mental healthcare increases by 8 percent. Interestingly, we find no evidence that the likelihood that an adult uses any mental healthcare varies with PSL mandates, which suggests that parents may prioritize their children's use of healthcare when time costs are relaxed. Moreover, we document that increased time flexibility allows children to receive care that is more time-intensive: following mandate adoption, we find a decrease in prescription-medication-only treatment, the least time-intensive treatment option, and increases in both outpatient/inpatient care with and without medication, two more time-intensive treatment modalities. One interpretation of these findings is that, as time constraints are relaxed, parents are able to better match mental healthcare to their children's specific treatment needs.

Medicaid—a public health insurance program for people with lower incomes and disabilities—is a vital source of health insurance for children in the US. We examine the extent to which Medicaid coverage influences children's outcomes. We test the importance of Medicaid postpartum coverage for continuation of medications used to treat opioid use disorder (MOUD).[5] Postpartum opioid use can be harmful to both the mother and the child. MOUDs—which are covered by most state Medicaid programs—are effective in reducing opioid use. However, until recently, Medicaid postpartum coverage ended after two months, creating a cliff in access to Medicaid generally and MOUD specifically for postpartum women. Beginning in 2021, Medicaid postpartum coverage was extended to 12 months. Using all-payer IQVIA claims data, we show that extending Medicaid coverage from two to ten months increases MOUD continuity among postpartum women by 5 to 9 percent. In a related paper using administrative data on substance use disorder (SUD) treatment episodes, we document limited impacts of expansions of income eligibility for Medicaid and the Children's Health Insurance Program (CHIP) on children's use of SUD treatment.[6] CHIP is a complementary public insurance program to Medicaid for children in families with lower income levels. Difficulty in accessing specialist SUD care among those covered by public insurance may limit the impact of these expansions. We find that state laws requiring coverage for SUD services in commercial insurance plans increase children's use of SUD care by 26 percent, perhaps through spillovers on public insurance programs.

Healthcare Supply and Education

In a series of related studies, we examine how increasing the supply of MHSUD treatment providers influences children's MHSUD outcomes and involvement with violence—both as offenders and as victims. Features of MHSUDs such as impaired decision-making or attention can increase the risk of both crime commission and victimization. Treatment for MHSUDs is, on average, effective, but there are long-standing and well-established shortages of MHSUD providers within the US healthcare system. For example, according to government data, nearly 50 percent of people reside in mental healthcare shortage areas and just 20 percent of individuals with a SUD receive any related care each year. We examine how changes in the supply of MHSUD treatment influence child 1) deaths by suicide and by fatal drug overdose or alcohol poisoning, 2) arrest rates and associated social costs, and 3) maltreatment reports. We proxy changes in access to MHSUD treatment with fluctuations in the number of 1) office-based physicians (e.g., psychiatrists) and non-physicians (e.g., psychologists and social workers), and 2) residential and outpatient treatment centers specializing in MHSUD treatment within a county. These providers can treat most major MHSUDs with pharmacotherapy, psychotherapy, inpatient care, "wraparound" services (e.g., educational programming), and other treatments.

First, we show that increases in the number of MHSUD providers within a local market reduce deaths associated with MHSUDs among children. More specifically, a 10 percent increase in the number of office-based physicians and non-physicians reduces the suicide rate by 2 percent and a similarly sized increase in the number of residential and outpatient centers reduces the rate of deaths by suicide, and fatal drug overdoses and alcohol poisonings by less than 1 percent.[7,8] Second, using FBI data, we find that a 10 percent increase in the number of offices of physicians and non-physicians specializing in MHSUD care in a county reduces child arrests by 1 percent, which results in a 5 percent reduction in the social cost of these arrests.[9] A back-of-the-envelope calculation indicates that this change reflects an annual saving of $3,683 in crime costs per capita for the US. Third, using administrative data, we estimate that a 10 percent increase in the number of outpatient and residential centers reduces reports of child maltreatment to CPS by 1 percent.[10] We show that improvements in management of both child and parent MHSUDs appear to be important mechanisms for this finding. In a follow-up paper using FBI data, we further explore public safety and find that a 10 percent increase in the number of MHSUD providers leads to a 1 percent reduction in assaults on police officers.[11] A strong public safety system could have beneficial effects for children.

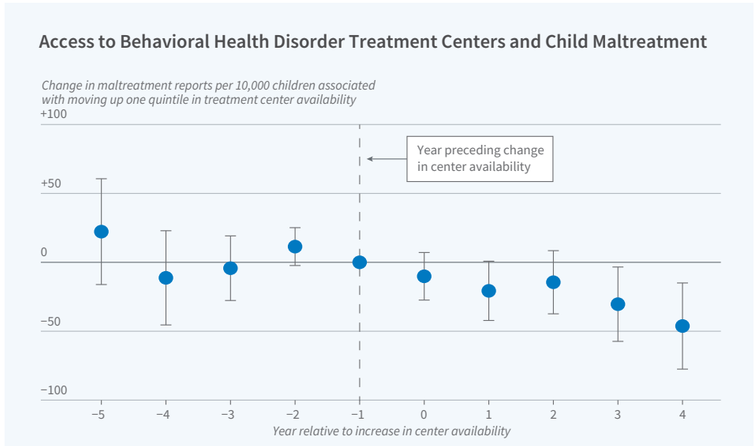


Figure 2

We also examine how features of the school environment influence children's wellbeing. Given that school-aged children spend a substantial amount of time in educational settings, understanding whether school characteristics impact children is important.[12] We find that increasing the share of female peers in the school improves mental health among both boys and girls. We estimate that a 5 percentage point increase in the share of female peers at school decreases the propensity to meet the clinical threshold for depression among boys by 10 percent and among girls by 2 percent. Improvements in mental health are accompanied by stronger school friendships for boys and improved self-image for girls—these findings hint at the mechanisms between the observed peer relationships at school and mental health among children.

Summary

Taken together, our studies indicate that investments across a range of social programs including insurance, healthcare, and education can meaningfully improve child wellbeing. Our studies have primarily focused on the short-run effects of these programs. Given that childhood includes key developmental periods, the life course impacts could be even larger. Our research contributes to the literature that documents positive spillovers of public policies on child wellbeing.

[1] "The Effects of State Paid Sick Leave Mandates on Parental Childcare Time," Maclean JC, Pabilonia SW. NBER Working Paper 32710, April 2025.
Return to text

[2] "Paid Sick Leave and Child Maltreatment," Deza M, Maclean JC, Ortega A. NBER Working Paper 33758, October 2025.
Return to text

[3] "Does Paid Sick Leave Facilitate Reproductive Choice?" Maclean JC, Ortega A, Popovici I, Ruhm CJ. NBER Working Paper 31801, September 2025.
Return to text

[4] "Time for Mental Healthcare: Evidence from Paid Sick Leave Mandates," Eisenberg M, Ge Y, Golberstein E, Maclean JC. NBER Working Paper 34254, September 2025.
Return to text

[5] "Medicaid Coverage and Postpartum Opioid Use Disorder Treatment," Gupta S, Ge Y, Maclean JC, Eisenberg MD. NBER Working Paper 34541, December 2025.
Return to text

[6] "Insurance Expansions and Children's Use of Substance Use Disorder Treatment," Hamersma S, Maclean JC. NBER Working Paper 24499, February 2020.
Return to text

[7] "Office-Based Mental Healthcare and Juvenile Arrests," Deza M, Lu T, Maclean JC. NBER Working Paper 29465, November 2021, and *Health Economics* 31(S2), August 2022, pp. 69–91.
Return to text

[8] "Mental Health, Substance Use, and Child Maltreatment," Ali MM, Lu T, Maclean JC, Meinhofer A. NBER Working Paper 32895, August 2024.
Return to text

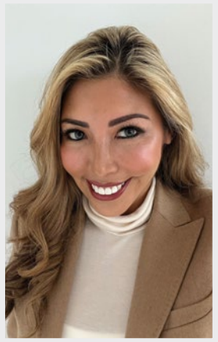
[9] "Office-Based Mental Healthcare and Juvenile Arrests," Deza M, Lu T, Maclean JC. NBER Working Paper 29465, November 2021, and *Health Economics* 31(S2), August 2022, pp. 69–91.
Return to text

[10] "Mental Health, Substance Use, and Child Maltreatment," Ali MM, Lu T, Maclean JC, Meinhofer A. NBER Working Paper 32895, August 2024.
Return to text

[11] "Treatment for Mental Health and Substance Use: Spillovers to Police Safety," Deza M, Lu T, Maclean JC, Ortega A. NBER Working Paper 31391, February 2024.
Return to text

[12] "More Girls, Fewer Blues: Peer Gender Ratios and Adolescent Mental Health," Deza M, Zhu M. NBER Working Paper 34269, September 2025.
Return to text

Monica Deza



Monica Deza is an associate professor in the Department of Economics at Syracuse University. Deza received her PhD in economics from the University of California, Berkeley in 2012. Her research interests include the economics of crime and risky health behaviors, labor economics, and economic demography. Deza's research examines determinants of risky health behaviors among youth, particularly drug use and criminal behavior, using empirical methods that run the gamut from quasi-experimental to structural. Her research provides a means of better understanding the extent to which policies that are not specifically intended to decrease crime (e.g., related to education, access to mental healthcare, labor markets, and climate, among others) can have important and previously underappreciated positive spillovers. Deza is a faculty research fellow at the NBER affiliated with the Economics of Health and Children and Families programs and a research affiliate at the Center for Health Economics of Treatment Interventions for Substance Use Disorder, HCV, and HIV.

Johanna Catherine Maclean

Johanna Catherine Maclean is an associate professor at the Schar School of Policy and Government at George Mason University. She is a health and labor economist working mainly in the areas of mental health, substance use (tobacco products, alcohol, and illicit drugs), and public policies. She serves as a coeditor at the *Journal of Policy Analysis and Management* and an associate editor at the *Journal of Health Economics*. She is also a research associate at the NBER affiliated with the Economics of Health program. To date, she has published 100 peer-reviewed articles, and her research has been funded by the National Institutes of Health, the Food and Drug Administration, the American Cancer Society, the Robert Wood Johnson Foundation, the Washington Center for Equitable Growth, the Well Being Trust, and the American Heart Association.

Alberto Ortega

Alberto Ortega is an assistant professor at the O'Neill School of Public and Environmental Affairs at Indiana University. His research focuses on the economics of risky health behaviors, crime, and external causes of injury. This research includes contributions in the areas of substance use, mental health, domestic violence, and policing. He is a faculty research fellow at the NBER affiliated with the Economics of Health program, and a research affiliate at the Samuel DuBois Cook Center on Social Equity and at the Wilson Sheehan Lab for Economic Opportunities. His research has received support from Arnold Ventures, the Institute for Research on Poverty, the Russell Sage Foundation, and the Spencer Foundation.

NBER News

Indian School of Business—NBER Research Conference, 2025

The Indian School of Business (ISB) in Hyderabad, India, hosted the fourth meeting in the annual joint ISB-NBER conference series on December 13–14, 2025. The meeting, which focused on "Household Finance Across the Lifecycle," was co-organized by Shilpa Aggarwal of ISB and Amit Seru of Stanford University and the NBER. The conference program included eight research papers that touched on many central topics in Indian household finance, including the lifecycle profile of saving rates, access to credit for large purchases of durable goods and housing, portfolio choice and the factors that influence it, the relative importance of banks and other lending institutions, and the role of various insurance products, such as health insurance and deposit insurance, in affecting household behavior. The conference also included two panel discussions that reviewed the current state of research on household finance. One focused on India and the other on the United States, thereby facilitating the identification of similarities and differences between household financial practices in the two countries.

NBER Launches Initiative on Economic Measurement

Recognizing the challenges to traditional approaches of economic measurement—among others, declining survey response rates, the growing economic significance of hard-to-measure digital services, and the rise of the gig economy—the NBER has launched a new initiative on economic statistics. The National Science Foundation (NSF) has awarded the NBER a multiyear grant to promote research on economic measurement as well as the development and implementation of new approaches to creating official economic statistics. The Economic Measurement Research Institute (EMRI) is codirected by research associates Katharine Abraham of the University of Maryland and Matthew Shapiro of the University of Michigan. Its goal is to support research on methods of data collection, construction, and dissemination that can advance the measurement of the twenty-first century economy, including the effects of fundamental changes in technology on the structure and performance of the US economy. The EMRI will fund research projects in response to an annual call for proposals.

A closely related project on advancing economic measurement, supported by the Alfred P. Sloan Foundation and directed by research associate Karen Dynan of Harvard University, will also promote innovative approaches to creating economic statistics. Working in coordination with the EMRI, it will host a series of conferences highlighting how private-sector data resources—such as financial transactions, payroll records, and information from online marketplaces—can be used to improve measures of aggregate economic activity and other key indicators.

Leahy and Mulligan Take Federal Reserve and SBA Roles

Left to right: John Leahy, Casey Mulligan

NBER research associates John Leahy and Casey Mulligan have been tapped for new roles in the Federal Reserve System and at the Small Business Administration, respectively. Leahy has been named the Director of Research at the Federal Reserve Bank of Chicago, a post he will take up at the start of 2026. He is the Allen Sinai Professor of Macroeconomics and Public Policy, and current department chair, at the University of Michigan. He is a research associate in the Economic Fluctuations and Growth (EFG) and Monetary Economics (ME) programs at the NBER and has served as coeditor of the *NBER Macroeconomics Annual*. Mulligan, who is currently on leave from the NBER, is serving as the chief counsel advocacy at the US Small Business Administration. He is a professor of economics in the Kenneth C. Griffin Department of Economics at the University of Chicago, and a research associate in four NBER programs: EFG, Economics of Aging, ME, and Public Economics.

**Editorial note: This news story was posted by the NBER on October 23, 2025. Sadly, on December 21st, 2025, John Leahy passed away.*

Philippe Aghion, Peter Howitt, and Joel Mokyr Awarded 2025 Nobel Prize

Left to right: Philippe Aghion, Peter Howitt, Joel Mokyr

Philippe Aghion, research associate Peter Howitt, and NBER board member Joel Mokyr have been awarded the 2025 Nobel Memorial Prize in Economic Sciences "for having explained innovation-driven economic growth." The Royal Swedish Academy of Sciences, in announcing the prize, explained that their studies have illuminated the process by which "new products and production methods [replace] old ones in a never-ending cycle. This is the basis for sustained economic growth, which results in a better standard of living…" The prize-winning research has emphasized the critical role of economic institutions in determining the impact of new innovations and provided essential insights on the dynamics of creative destruction.

Aghion is a professor at the Collège de France and INSEAD. He was an NBER research associate affiliated with the Economic Fluctuations and Growth (EFG) program for more than a decade when he was on the Harvard University faculty. Howitt, a professor of economics and the Lyn Crost Professor of Social Sciences at Brown University, is a research associate in the EFG program. Mokyr is the Robert H. Strotz Professor of Arts and Sciences and professor of economics and history at Northwestern University. He is also the Sackler Professor at the Eitan Berglas School of Economics at the University of Tel Aviv. For more than three decades, he has been a member of the NBER Board of Directors, representing Northwestern University.

In announcing the prize, the Academy released a detailed account of the laureates' scientific contributions.

With this year's awards, 43 current or past NBER research affiliates, and an additional seven current or past members of the NBER Board of Directors, have received the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel. Affiliates awarded the prize are Philippe Aghion and Peter Howitt, 2025; Daron Acemoglu, Simon Johnson, and James Robinson, 2024; Claudia Goldin, 2023; Ben Bernanke and Douglas Diamond, 2022; Joshua Angrist, David Card, and Guido Imbens, 2021; Abhijit Banerjee, Esther Duflo, and Michael Kremer, 2019; William Nordhaus and Paul Romer, 2018; Richard Thaler, 2017; 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; 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; Edward C. Prescott, 2004; 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 to this group, the seven current or past NBER directors who have received the prize are: Joel Mokyr, 2025; George Akerlof, 2001; and the late William Vickrey, 1996; Douglass North, 1993; Robert Solow, 1987; James Tobin, 1981; and Paul Samuelson, 1970.

NBER Appoints 51 Research Associates, Fall 2025

The NBER Board of Directors appointed 51 research associates, 49 of whom were promoted from faculty research fellows, at its September 2025 meeting. Two of the new appointees were former research associates who resigned from the NBER for public service and who have returned to their universities. Research associates must be tenured faculty members at North American colleges or universities; their appointments are recommended to the board by directors of the NBER's 19 research programs, typically after consultation with a steering committee of leading scholars. The new research associates are affiliated with 33 different colleges and universities, and they received graduate training at 27 different institutions. Following the promotions, the NBER has 1,576 research associates and 270 faculty research fellows. The names and universities of the new research associates and their NBER program affiliations are listed below.

* Returning from government service
** Promotion following NBER board service

Name	University Affiliation	University of PhD	Program
Vellore Arthi	UC, Irvine	University of Oxford	Development of the American Economy
Tania Babina	University of Maryland	University of North Carolina	Productivity, Innovation, and Entrepreneurship
Vittorio Bassi	University of Southern California	University College London	Development Economics
Patrick Button	Tulane University	UC, Irvine	Economics of Aging
Alberto Cavallo	Harvard University	Harvard University	International Finance and Macroeconomics
Jonathan Dingel	Columbia University	Columbia University	International Trade and Investment
Winston Wei Dou	University of Pennsylvania	MIT	Asset Pricing
Mark Egan	Harvard University	University of Chicago	Corporate Finance
Andreas Ferrara	University of Pittsburgh	University of Warwick	Development of the American Economy
Martin Fiszbein	Boston University	Boston University	Development of the American Economy, Political Economy
Teresa Fort	Dartmouth College	University of Virginia	International Trade and Investment
Jorge García	Texas A&M University	University of Chicago	Children and Families
Gita Gopinath*	Harvard University	Princeton University	International Finance and Macroeconomics, Economic Fluctuations and Growth, and Monetary Economics
Johannes Haushofer	Cornell University	University of Zurich	Development Economics
Bernard Herskovic	UC, Los Angeles	New York University	Asset Pricing
Kilian Huber	University of Chicago	London School of Economics	Monetary Economics
Matthew Johnson	Duke University	Boston University	Labor Studies
Karam Kang	University of Wisconsin-Madison	University of Pennsylvania	Political Economy
Adam Kapor	Princeton University	Yale University	Industrial Organization
Krzysztof Karbownik	Emory University	Uppsala University	Children and Families, Economics of Education
Chad Kendall	University of Miami	University of British Columbia	Political Economy
Adriana Kugler*	Georgetown University	UC, Berkeley	Labor Studies, Children and Families
Thibault Lamadon	University of Chicago	University College London	Labor Studies
Tim Landvoigt	University of Pennsylvania	Stanford University	Asset Pricing
Ernest Liu	Princeton University	MIT	International Trade and Investment, Development Economics, and Economic Fluctuations and Growth
Benjamin Lockwood	University of Pennsylvania	Harvard University	Public Economics
Corina Mommaerts	University of Wisconsin-Madison	Yale University	Economics of Aging, Public Economics, and Economics of Health
Alan Moreira	New York University	University of Chicago	Asset Pricing

Name	University Affiliation	University of PhD	Program
Richard Murphy	University of Texas at Austin	University College London	Economics of Education
Emily Nix	University of Southern California	Yale University	Law and Economics, Labor Studies
Michaela Pagel	Washington University in St. Louis	UC, Berkeley	Asset Pricing
Cecilia Parlatore	New York University	New York University	Asset Pricing
Petra Persson	Stanford University	Columbia University	Public Economics, Economics of Health, and Children and Families
Nolan Pope	University of Maryland	University of Chicago	Economics of Education
Tommaso Porzio	Columbia University	Yale University	Development Economics
Robert Richmond	New York University	UC, Los Angeles	Asset Pricing
Evan Riehl	Cornell University	Columbia University	Economics of Education
Matthew Rognlie	Northwestern University	MIT	Monetary Economics, Economic Fluctuations and Growth
Raffaele Saggio	University of British Columbia	UC, Berkeley	Labor Studies
Seth Seabury	University of Southern California	Columbia University	Economics of Health
Bradley Setzler	Pennsylvania State University	University of Chicago	Labor Studies
Jorg Spenkuch	Northwestern University	University of Chicago	Political Economy
Ann Huff Stevens**	University of Colorado-Boulder	University of Michigan	Labor Studies, Children and Families
Maria Micaela Sviatschi	Princeton University	Columbia University	Development Economics, Political Economy
Eric Taylor	Harvard University	Stanford University	Economics of Education
Rosen Valchev	Boston College	Duke University	International Finance and Macroeconomics
Emil Verner	MIT	Princeton University	International Finance and Macroeconomics, Corporate Finance, and Development of the American Economy
Melanie Wasserman	UC, Los Angeles	MIT	Labor Studies, Economics of Education
Michael Weber	Purdue University	UC, Berkeley	Asset Pricing, Monetary Economics
Barton Willage	University of Delaware	Cornell University	Economics of Health
Kevin Williams	Yale University	University of Minnesota	Industrial Organization

Six New Directors Elected to NBER Board, Fall 2025

Left to right: Jason Abrevaya, Siwan Anderson, Stéphane Bonhomme

Left to right: Gary Hansen, Bo Honoré, Justin Muzinich

Jason Abrevaya, Siwan Anderson, Stéphane Bonhomme, Gary Hansen, Bo Honoré, and Justin Muzinich were elected to the NBER Board of Directors at the Board's September 29 meeting.

Abrevaya represents the University of Texas, Austin, where he is the Murray S. Johnson Professor of Economics and past department chair. He currently serves as associate dean for graduate education. His research combines econometric methodology and applied microeconomics; he has studied treatment effect estimation, birth outcomes, smoking, and vaccine mandates. He co-founded the *Journal of Econometric Methods* and is a director of the Western Economic Association International. Abrevaya received his AB in applied mathematics and economics from Harvard University and his PhD in economics from MIT.

Anderson represents the Canadian Economics Association. She is a professor at the Vancouver School of Economics at the University of British Columbia. Her research falls primarily in development economics, with an emphasis on micro level institutions and gender, property rights and marriage payments, caste and trade, and local governance. Much of her research focuses on South Asia. A coeditor of the *Journal of Development Economics*, she earned her BSc in mathematics and her MA and PhD in economics from the University of British Columbia.

Bonhomme represents the University of Chicago, where he is the Ann L. and Lawrence B. Buttenwieser Professor of Economics. His research focuses on microeconometrics and econometric theory. He has developed methods for estimating latent variable and factor models and advanced methods for analyzing nonlinear panel data. He has applied these tools to study labor economics issues using administrative and matched employer-employee data. Bonhomme was an undergraduate at the École Normale Supérieure de Lyon and he received his PhD in economics from Université Paris I Panthéon-Sorbonne. He is a fellow of the Econometric Society.

Hansen represents the University of California, Los Angeles, where he is a professor of economics and past department chair. His research focuses on macroeconomic fluctuations and equilibrium models of business cycles, with an emphasis on how labor market frictions can amplify the impact of economic shocks on hours of work. He has also studied fiscal policy in Japan, consumption taxation, and the macroeconomics of publicly provided health insurance and long-term care. Hansen received his undergraduate degree in economics and mathematics from the University of Puget Sound, and his PhD in economics from the University of Minnesota.

Honoré represents Princeton University, where he is the Class of 1913 Professor of Political Economy, professor of economics, a past department chair, and the current director of graduate studies and admissions. He has made key contributions to the design and analysis of semiparametric and nonparametric econometric methods, selection and truncation models, dynamic discrete choice, and panel data approaches to unobserved heterogeneity. Honoré was an undergraduate at the University of Aarhus and received his PhD in economics from the University of Chicago. He has served as vice-chair of the Danish National Research Foundation and is a fellow of the Econometric Society and a member of the American Academy of Arts and Sciences.

Muzinich, an at-large board member, is the chief executive officer of Muzinich & Co, a New York-headquartered investment firm specializing in public and private corporate credit. From 2018 to 2021, he served as US Deputy Secretary of the Treasury, overseeing domestic and national security policy for the Treasury, helping to lead the economic response to COVID-19, and representing the US at the G7, the G20, and the OECD. He has served as a distinguished fellow at the Council on Foreign Relations (CFR) and as a senior fellow at the John F. Kennedy School of Government at Harvard University. He is a director of the CFR and New York-Presbyterian Hospital. Muzinich holds an undergraduate degree in social studies from Harvard College, a JD from Yale Law School, and an MBA from Harvard Business School.

The Board also reelected at-large directors Peter Henry and Hal Varian, and Joel Mokyr, who represents Northwestern University, and Dana Peterson, who represents the Conference Board. Alan Deardorff and Gregor Smith were elected to emeritus status.

Conferences and Meetings

Detailed programs for NBER conferences are available at nber.org/conferences

Title of Conference/Meeting	Organizers	Dates
Fiscal Dynamics of State and Local Governments	Jeffrey Clemens and James M. Poterba	September 11–12
The Economics of Decarbonizing Industrial Production	Lint Barrage and Kenneth Gillingham	September 11–12
40th Annual NBER Tax Policy and the Economy Conference	Damon Jones and Robert A. Moffitt	September 18
Economics of Transformative AI Workshop	Ajay K. Agrawal, Anton Korinek, and Erik Brynjolfsson	September 18–19
Financial Market Frictions and Systemic Risks	Wenxin Du, Alp Simsek, Chester S. Spatt, and Mao Ye	September 18–19
Economics of Science	Megan MacGarvie and Reinhilde Veugelers	September 25–26
Economics of Executive Compensation Research Conference	Dirk Jenter and Kelly Shue	October 9–10
Climate Finance	Caroline Flammer and Stefano Giglio	October 10
The Economics of Firearm Markets, Crime, and Gun Violence	Marcella Alsan, Philip J. Cook, and Sara B. Heller	October 10
Political Economy Program Meeting	Laurent Bouton, Eliana La Ferrara, and Rohini Pande	October 17
Economics of Race and Stratification	Trevon D. Logan	October 17
Market Design Working Group Meeting	Eric Budish, Michael Ostrovsky, and Parag A. Pathak	October 17–18
Transportation Networks and the Spatial Distribution of Economic Activity	Stephen J. Redding and Myrto Kalouptsidi	October 17–18
Public Economics Program Meeting	Patrick J. Kennedy and Matthew J. Notowidigdo	October 23–24
Megafirms and the Economy	Chad Syverson and John Van Reenen	October 24
Economic Analysis of Business Taxation	Juan Carlos Suárez Serrato and Eric Zwick	October 24
Economic Fluctuations and Growth Program Meeting	Corina Boar and Giovanni L. Violante	October 24
Economics of Transportation in the 21st Century	Edward L. Glaeser, James M. Poterba, and Stephen J. Redding	October 24
International Finance and Macroeconomics Program Meeting	Laura Alfaro and Enrique G. Mendoza	October 24
ADRD Coordinating Center Meeting	Rhoda Au, Julie Bynum, and Kathleen M. McGarry	October 30
Monetary Economics Program Meeting	Amir Kermani and Matthew Rognlie	October 31
Economics of Talent Meeting	Glenn Ellison, Ruchir Agarwal, Patrick Gaulé, and Britta Glennon	November 7
Corporate Finance Program Meeting	Kenneth R. Ahern and Mark L. Egan	November 7
Asset Pricing Program Meeting	Hui Chen and Samuel M. Hartzmark	November 7
Advancing Economic Measurement	Karen Dynan and James M. Poterba	November 13

Conferences and Meetings (continued)

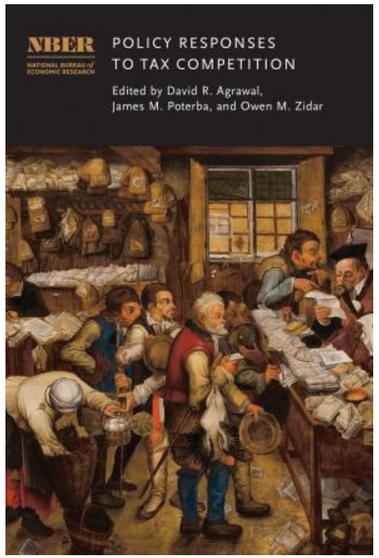
Detailed programs for NBER conferences are available at nber.org/conferences

Title of Conference/Meeting	Organizers	Dates
Organizational Economics Working Group	Raffaella Sadun and Andrea Prat	November 13–14
Labor Studies Program Meeting	David Autor and Alexandre Mas	November 14
Behavioral Finance Working Group Meeting	Nicholas C. Barberis	November 14
Risk and Risk Management in the Agricultural Economy	Barry Goodwin and Tatyana Deryugina	November 20–21
Innovative Data in Household Finance	Julia Fonseca, Scott T. Nelson, and Stephen P. Zeldes	November 21
International Trade and Investment Program Meeting	Stephen J. Redding	November 21–22
Economics of Education Program Meeting	Caroline M. Hoxby, Robert McMillan, and Jonah E. Rockoff	December 4–5
Big Data, Artificial Intelligence, and Financial Economics	Itay Goldstein, Chester S. Spatt, Mao Ye, and Tarun Ramadorai	December 5
Place-Based Policies and Entrepreneurship	Sabrina T. Howell, Josh Lerner, and David T. Robinson	December 5
BREAD/Development Economics Program Meeting	Jenny Aker, Pascaline Dupas, Garance Genicot, Edward Miguel, Benjamin A. Olken, Frank Schilbach, and Enrique Seira	December 5
Innovation Information Initiative Technical Working Group Meeting	Matt Marx	December 5–6
Disaggregated National Accounts: Measurement and Application	Kilian Huber and Ludwig Straub	December 11
Industrial Organization of Housing Markets	Sophie Calder-Wang, Rebecca Diamond, Shoshana Vasserman, and Winnie van Dijk	December 12
Household Finance across the Lifecycle	Shilpa Aggarwal and Amit Seru	December 13–14
Chinese Economy Working Group Meeting	Hanming Fang, Zhiguo He, Shang-Jin Wei, and Wei Xiong	December 15–16

Books

Policy Responses to Tax Competition

David R. Agrawal, James M. Poterba, and Owen M. Zidar, editors.



Policy Responses to Tax Competition provides an in-depth exploration of how jurisdictions design taxes on mobile economic factors. Tax competition between jurisdictions that seek to attract businesses and residents presents both opportunities and challenges. It can foster government efficiency and provide a counterweight to lobbying for increased spending, but it can also result in inefficiently low tax rates and revenue shortfalls as jurisdictions vie for tax bases. This volume examines the economic drivers and consequences of tax competition and presents empirical evidence on its effects.

The volume has three parts. The first reviews existing research on the determinants and consequences of tax competition and related policy initiatives such as development incentives.

The second focuses on specific policies, such as the Kansas-Missouri noncompete pact and international measures like the OECD's Base Erosion and Profit Shifting initiative, that are designed to limit tax competition. It also considers the economic responses to these policies, the distributional impact of competition-reducing policies, and potential strategic reactions of other governments.

The final section presents case studies of the effects of various policies, including intermunicipal cooperation in France and corporate tax equalization in Switzerland. The results in this volume provide new insights on the nature of interjurisdictional tax competition and the range of potential responses available to jurisdictions at various levels in federal systems.