

The Reporter

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Program Report: Development Economics

Seema Jayachandran and Benjamin A. Olken

The [Development Economics \(DEV\) program](#) was launched in 2012 and has 190 affiliated researchers. The success the program is enjoying today is in very large part thanks to [Duncan Thomas](#), who led the program for its first six years. A unique aspect of the program is its close connections with BREAD, the Bureau for Research and Economic Analysis of Development, which is an independent group with worldwide membership. Our fall program meeting is held jointly with BREAD every other year.

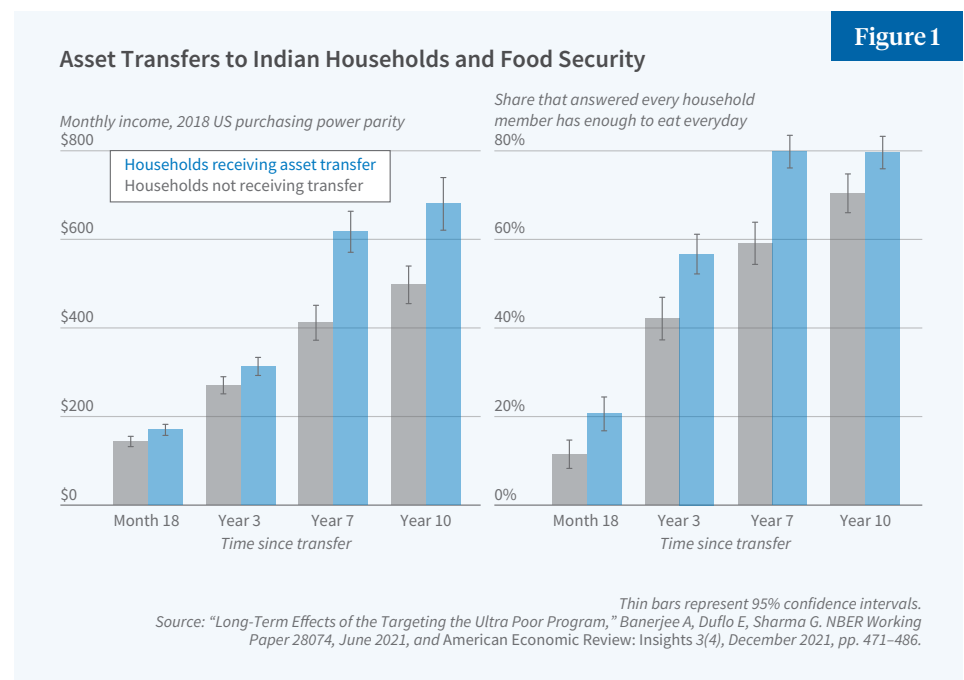
Development economics is, broadly speaking, the study of two questions. First, why are some countries poor while other countries are wealthy? Second—and this is a vast topic which comprises much of the group’s research—how do the particular circumstances of low- and middle-income countries shape the functioning of markets and other types of economic activities? Put another way, for the many areas we study in economics and for which NBER programs exist—such as labor, health, industrial organization, and the environment—how are the economics different in countries that are typically poorer, with more informality and often a weaker institutional sector than in wealthy countries?

These broad questions have been studied for decades, but the specific focus of the research is constantly evolving. Our goal in this summary is to take stock of themes that have emerged or become more central to the program’s work in the period since the last [Development Economics Program Report in 2018](#).

We began this piece by considering which substantive themes have been most prominent in recent years.

Our holistic assessment of the field is based on helping to organize and participating in NBER conferences, and reading new NBER Working Papers over this period. We don’t claim that our summary is definitive or exhaustive; we highlight four themes that stood out for us as illustrative of the exciting research happening in development economics.

We then conducted an experiment to see how our assessment of



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the prominent research topics in this program compared to that of a generative AI model. After finalizing our summary, we uploaded the titles, authors, and abstracts of all 1,972 NBER Working Papers in the DEV program from its inception through the end of 2025 to ChatGPT version 5.2.

We report our summary and then ChatGPT's summary below, followed by its answers to two bonus questions we asked it about trends within the program, specifically which themes have become less prominent over time and what the important methodological pivots have been.

Program Directors' Summary: Four Important Themes

One theme that has received substantial attention is the design of anti-poverty **social protection** programs and their impacts. This has been a long-standing area of interest in development economics, but activity has surged in recent years. Many recent studies examine cash transfers, which have become more widespread in part because the expansion of mobile money and electronic banking has simplified the logistics of delivering them. As one example, Dennis Egger, Johannes Haushofer, Edward Miguel, Paul Niehaus, and Michael Walker study the impacts of unconditional cash transfers provided to households in rural Kenya using a research design that can capture the general equilibrium effects of the transfers and quantify the multiplier effect that arises as the transferred money ricochets through the local economy.¹

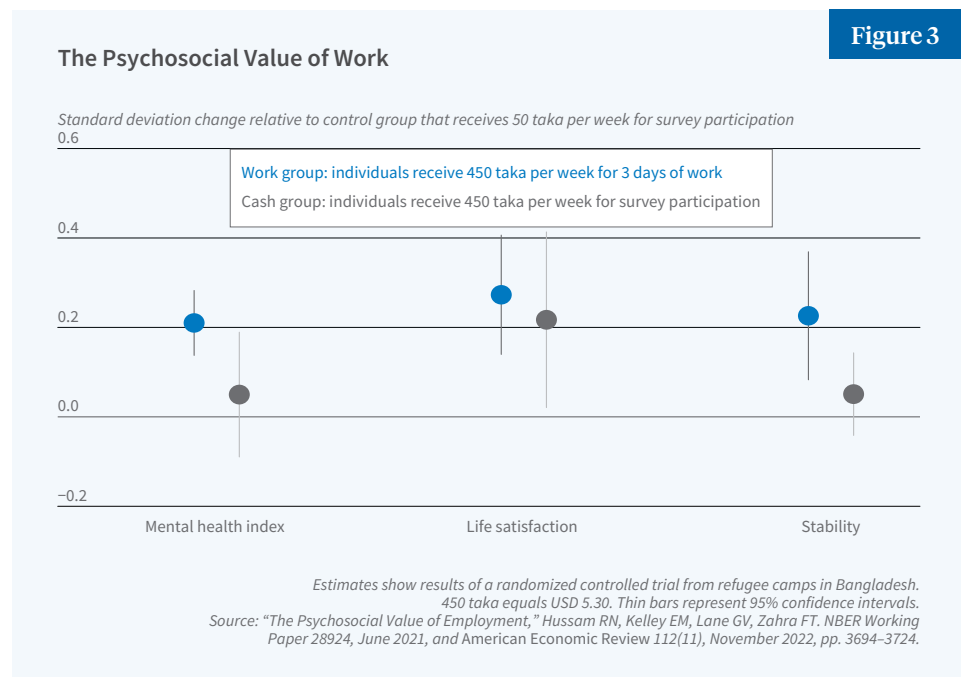
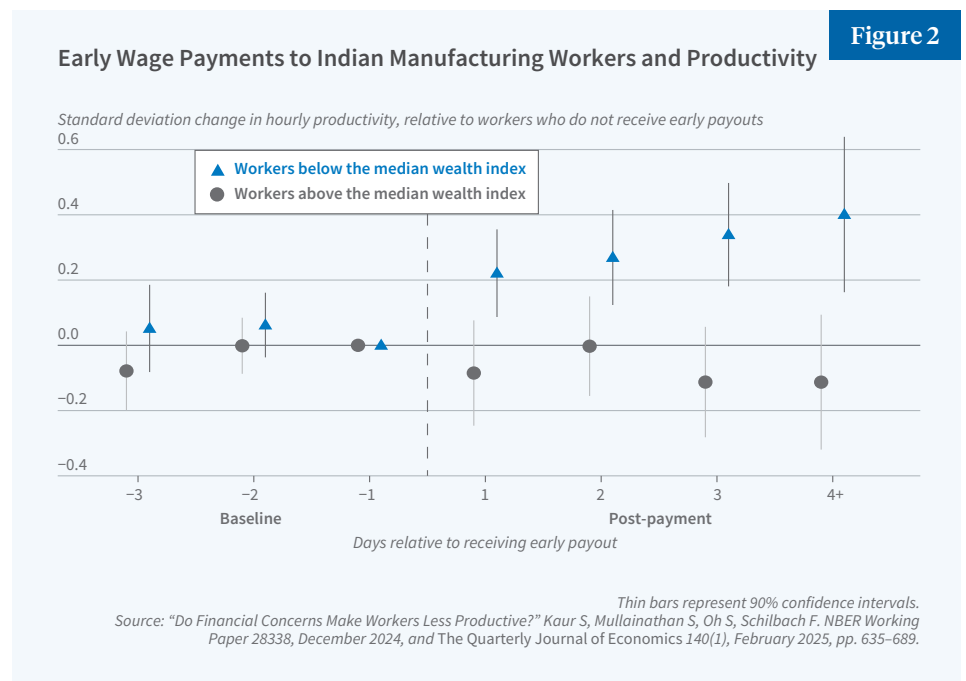
Among non-cash transfer programs, one that gained attention a decade ago is the multifaceted "graduation" program pioneered by the Bangladeshi nonprofit BRAC. In recent years, researchers have analyzed long-run effects of the program, for example, as done by Abhijit Banerjee, Esther Duflo, and Garima Sharma for India; conducted multi-arm randomized trials to understand which components of the multifaceted program are crucial and which might be extraneous, for example, as done by Emily Beam, Lasse Brune, Narayan

Das, Stefan Dercon, Nathanael Goldberg, Rozina Haque, Dean Karlan, Maliha Khan, Doug Parkerson, Ashley Pople, Yasuyuki Sawada, Christopher Udry, and Rocco Zizzamia for Ghana; and used the program as a laboratory to test whether households face poverty traps, as done by Clare Balboni, Oriana Bandiera, Robin Burgess, Maitreesh Ghatak, and Anton Heil for Bangladesh.^{2,3,4}

Another active area within social protection is targeting, or identifying which households should be beneficiaries. Researchers have investigated machine-learning approaches that target the expected gains from treatment (Johannes Haushofer, Paul Niehaus, Carlos Paramo, Edward Miguel, and Michael W. Walker), elicitation of the community's opinion (Sudarno Sumarto, Elan Satriawan, Benjamin A. Olken, Abhijit Banerjee, Achmad Tohari, Vivi Alatas, and Rema Hanna), and workfare-type schemes (Marianne Bertrand, Bruno Crépon, Alicia Marguerie, and Patrick Premand), for example.^{5,6,7} This literature highlights that a policymaker's choice about whom to target often is a balancing act among cost and other practicalities, multiple program goals, distributional concerns, and tolerance for errors of inclusion versus errors of exclusion.

A second theme that has emerged in recent years is the **psychology of poverty**, or how poverty affects cognition and mental health. For example, Supreet Kaur, Sendhil Mullainathan, Suanna Oh, and Frank Schilbach use an intricately designed experiment in India to document how financial worries occupy workers' thoughts while they are on the job and dampen their performance; cash-rich workers are more productive workers.⁸ Francis Annan and Belinda Archibong provided mobile phone credit to individuals in Ghana during the COVID-19 pandemic and found that doing so reduced recipients' psychological distress.⁹

Researchers are also increasingly studying mental health problems, which often go undiagnosed and untreated in low- and middle-income countries. Nathan Barker, Gharad Bryan, Dean Karlan, Angela Ofori-At-

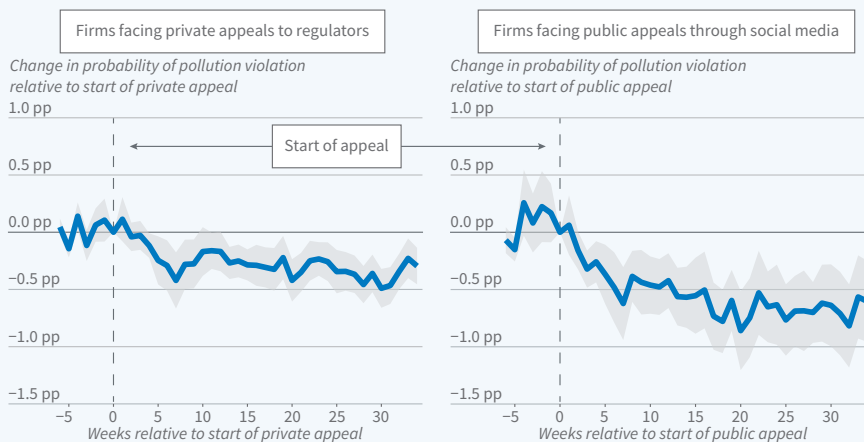


ta, and Christopher Udry find that cognitive behavioral therapy improved mental health, cognition, and physical health among a general population of poor households in Ghana, suggesting that mental health interventions can improve human capital and economic outcomes.¹⁰ Scholars are also increasingly collecting data on mental health outcomes to enrich our understanding of how policies can improve (or harm) people's welfare. For example, Reshmaan Hussam, Erin Kelley, Gregory Lane, and Fatima Zahra show that providing employ-

ment opportunities to individuals residing in refugee camps in Bangladesh improves their mental health (e.g., reduces depression) more than giving them an income-equivalent cash transfer does.¹¹

A third theme has been the **collection of microdata to answer macroeconomic questions** related to development, as highlighted by Francisco Buera, Joseph Kaboski, and Robert Townsend.¹² Sometimes the goal is to measure the general equilibrium effects of policies, as mentioned above when discussing cash transfers

Violation of Pollution Standards by Chinese Firms



Shaded areas represent 90% confidence intervals.
 Source: "Does the Squeaky Wheel Get More Grease? The Direct and Indirect Effects of Citizen Participation on Environmental Governance in China," Buntaine M, Greenstone M, He G, Liu M, Wang S, Zhang B. NBER Working Paper 30539, August 2023, and American Economic Review 114(3), March 2024, pp. 815–850.

under the theme of social protection. Another example comes from Lauren Bergquist, Craig McIntosh, and Meredith Startz, who quantify the effects of improved market integration resulting from the use of a matching platform that reduces search costs for buyers and sellers in agricultural markets in Uganda.¹³ David Atkin, Baptiste Bernadac, Dave Donaldson, Tishara Garg, and Federico Huneeus use comprehensive microdata on firms, workers, and purchases to understand who bears the ultimate incidence of distortions throughout the economy.¹⁴

The micro-macro approach has also been used to study poverty traps caused by lumpy capital goods that could increase productivity. An important drag on growth could stem from small firms being unable to achieve sufficient scale to cover fixed costs. Researchers have explored whether rental markets allow these capital costs to be smoothed over many small firms; Julieta Caunedo and Namrata Kala study this in agriculture in India, and Vittorio Bassi, Raffaella Muoio, Tommaso Porzio, Ritwika Sen, and Esau Tugume study it for manufacturing firms in Uganda.^{15,16} Small firms still might have preferences for larger, lumpier investments, as shown by Kaboski, Molly Lipscomb, Virgiliu Midrigan, and Carolyn Pelnik, but the findings on capital rental markets suggest that indivisibilities at the individual level may not pose as large an aggregate constraint as one may have thought.¹⁷

A fourth theme is the increasing work at the intersection of **environmental economics** and development economics. Much of this work is on climate change, which is projected to be particularly devastating in low- and middle-income countries. The harms from climate change are myriad. Water scarcity is upending the norms of coexistence between pastoralist and agricultural communities in Africa, as evidenced by increasing intergroup conflict, examined by Eoin McGuirk and Nathan Nunn.¹⁸ How households and communities adapt to climate change and counteract the harms is critically important, and researchers are beginning to make progress on

this. For example, Jenny Aker and Kelsey Jack study the barriers farmers in Niger face in adopting rainwater harvesting techniques that can help prevent the soil degradation and desertification brought about by climate change.¹⁹ Climate change will also make weather more variable in many places, and Fiona Burlig, Amir Jina, Kelley, Gregory Lane, and Harshil Sahai study whether access to accurate weather forecasts can help farmers in India prepare and tailor their actions to the likely realized weather.²⁰

Another topic at the development-environment nexus is the importance of political economy considerations. Nicholas Ryan and Anant Sudarshan explore an equity-efficiency trade-off in relation to a policy in India that manages groundwater use through rations rather than prices.²¹ Mark Buntaine, Michael Greenstone, Guojun He, Mengdi Liu, Shaoda Wang, and Bing Zhang look at the role of citizen complaints in addressing pollution through a nationwide randomized controlled trial in China and find that public complaints posted on social media led to measurable reductions in pollution, whereas equivalent complaints submitted directly to the government, but not posted on social media, do not lead to such reductions.²² At a more aggregate level, Allan Hsiao, Jacob Moscona, and Karthik Sastry show

that countries adjust their trade policy in response to climate-induced shocks to food productivity, particularly in election years. Although attempting to protect local farmers, this endogenous policy response limits the degree to which domestic consumers can benefit from improvements in foreign productivity and, on net, substantially reduces welfare for consumers in poor countries.²³

Generative AI Summary: Four Important Themes²⁴

ChatGPT delivered an alternative synthesis of the program. The prompts we used to generate the content below are available in the endnotes. While its summary highlights slightly different themes than our review, we are struck by the degree to which it is consistent with our assessment. The four main themes it suggested, reproduced verbatim, are:

"State Capacity, Governance, and Public Sector Effectiveness

A defining theme of DEV research since 2018 is a renewed focus on the state itself—how governments function, where they fail, and how capacity can be built. Papers study bureaucratic incentives, tax administration, procurement, regulation, and service delivery using administrative data and field experiments. Rather than treating

weak institutions as fixed background conditions, this literature analyzes specific mechanisms—monitoring, incentives, information systems—that shape public-sector performance. The shift is toward actionable evidence on how governments in low- and middle-income countries can implement policy effectively at scale.

Social Protection, Redistribution, and Targeting

Another central theme is the expansion and evaluation of social protection systems, especially cash transfers, in-kind benefits, and emergency assistance. Research in this period examines targeting accuracy, spillovers, labor supply effects, and political economy constraints. A notable development is the use of large administrative datasets to study national programs rather than small pilots, allowing analysis of scale, general equilibrium effects, and long-run outcomes. This work is closely connected to pandemic-era expansions of safety nets but extends beyond them to questions of permanent redistribution and fiscal sustainability.

Firms, Productivity, and Structural Transformation

DEV research from 2018–2025 places increasing emphasis on firms and markets as engines of growth. Papers study misallocation, management practices, access to finance, supply chains, and market power, often combining experimental interventions with administrative and transaction data. Rather than viewing development as a simple shift from agriculture to manufacturing, the literature emphasizes services, informality, and within-sector productivity gains. Structural transformation is treated as a complex, firm-level process shaped by institutions, competition, and policy.

Human Capital, Early-Life Interventions, and Long-Run Impacts

Human capital remains a core area, but the focus has shifted toward long-run and intergenerational effects. Research evaluates education,

health, nutrition, and early-childhood interventions with extended follow-up horizons, often linking experimental or quasi-experimental variation to adult outcomes. A key feature of this literature is its integration of administrative records—schooling, earnings, health—to assess persistence and heterogeneity of impacts. The emphasis is less on test scores alone and more on lifetime welfare, inequality, and mobility.”

Further AI-based Program Insights

We also gave ChatGPT two additional prompts. One was to identify themes that were central to the program in its first five years but have become less of a focus today. Here is the answer:

“Microcredit and Household Finance as Standalone Growth Tools

In the early DEV years, a large share of papers focused on microcredit, savings products, and household financial access as primary levers for poverty reduction. These studies often evaluated take-up, short-run consumption smoothing, and small business investment. While financial inclusion remains relevant, recent DEV research has largely moved away from treating microfinance as a transformative growth engine, instead embedding finance within broader analyses of firms, markets, and state capacity.

Agricultural Technology Adoption in Isolation

Between 2013 and 2017, many DEV papers examined adoption of specific agricultural inputs—fertilizer, seeds, irrigation—often via small-scale randomized trials. In the 2021–2025 period, agriculture is more likely to appear within integrated studies of land use, climate risk, value chains, or structural transformation, rather than as isolated input-adoption problems. The emphasis has shifted from “why don’t farmers adopt X?” to how agriculture fits into economy-wide development paths.

Education Interventions Measured Primarily by Test Scores

Earlier DEV research devoted substantial attention to education interventions evaluated using short-run learning outcomes, especially test scores. While education remains central, recent work places less weight on test scores alone and more on long-run, labor-market, and intergenerational outcomes. The decline is not in interest, but in the dominance of narrowly defined schooling metrics as endpoints.

Informality as a Binary Condition

In the early period, informality was often treated as a binary state—formal versus informal firms or workers—with policy aimed at formalization per se. More recent DEV work treats informality as a spectrum, focusing on productivity, firm capabilities, enforcement, and the costs and benefits of remaining informal. This reflects a shift from classification toward mechanism and policy design.”

Finally, we asked the AI tool to describe some of the main methodological pivots between 2013–17 and 2021–25. Here is its answer:

“From Small-Scale RCTs to Administrative Data at Scale

In 2013–2017, DEV research was dominated by village- or household-level randomized controlled trials, often designed to answer tightly framed questions about take-up or short-run behavior. By 2021–2025, RCTs are still important but are increasingly complemented—or replaced—by large administrative datasets covering millions of individuals, firms, or transactions. This shift enables researchers to study national programs, policy implementation, and long-run outcomes, moving DEV from proof-of-concept experiments toward evaluation at scale.

Greater Emphasis on Long-Run and Dynamic Effects

Earlier DEV work often relied on short follow-up windows due to data constraints, emphasizing immediate impacts on consumption, inputs, or test scores. Recent research designs

are explicitly dynamic, linking experimental or quasi-experimental variation to outcomes years later using administrative records. This allows credible analysis of persistence, fade-out, and intergenerational effects, fundamentally changing how interventions are judged.

Integration of Quasi-Experimental Designs with Rich Data

While causal inference was already central in 2013–2017, identification strategies have grown more sophisticated. The 2021–2025 literature frequently combines administrative data with natural experiments—policy thresholds, staggered rollouts, enforcement variation—using modern event-study and difference-in-differences frameworks. This reduces reliance on pure randomization while expanding the policy questions that can be addressed.

Measurement Innovation and Machine Learning

A notable methodological advance is the use of machine learning and new data sources to construct key variables—poverty proxies, firm productivity, targeting scores, or climate exposure. In earlier work, measurement was often coarse and survey-based. Recent DEV papers use ML as a complement to causal designs, improving precision and external validity without abandoning identification discipline.”

As with the summary of recent themes, we found ChatGPT’s answers interesting and broadly consistent with our own assessments.

¹ “General Equilibrium Effects of Cash Transfers: Experimental Evidence from Kenya,” Egger D, Haushofer J, Miguel E, Niehaus P, Walker MW. NBER Working Paper 26600, October 2021, and *Econometrica* 90(6), November 2022, pp. 2603–2643. [Return to text](#)

² “Long-Term Effects of the ‘Targeting the Ultra Poor’ Program,” Banerjee A, Duflo E, Sharma G. NBER Working Paper 28074, June 2021, and *American Economic Review: Insights* 3(4),

December 2021, pp. 471–486.

[Return to text](#)

³ “Group versus Individual Coaching for Rural Social Protection Programs: Evidence from Uganda, Philippines, and Bangladesh,” Beam EA, Brune L, Das N, Dercon S, Goldberg N, Haque R, Karlan D, Khan M, Parkerson D, Pople A, Sawada Y, Udry C, Zizzamia R. NBER Working Paper 34309, October 2025.

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⁴ “Why Do People Stay Poor?” Balboni CA, Bandiera O, Burgess R, Ghatak M, Heil A. NBER Working Paper 29340, October 2021, and *The Quarterly Journal of Economics* 137(2), May 2022, pp. 785–844.

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⁵ “Targeting Impact versus Deprivation,” Haushofer J, Neihaus P, Paramo C, Miguel E, Walker MW. NBER Working Paper 30138, December 2022.

[Return to text](#)

⁶ “Community Targeting at Scale,” Sumarto S, Satriawan E, Olken BA, Banerjee A, Tohari A, Alatas V, Hanna R. NBER Working Paper 33322, January 2025.

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⁷ “Do Workfare Programs Live Up to Their Promises? Experimental Evidence from Côte d’Ivoire,” Bertrand M, Crépon B, Marguerie A, Premand P. NBER Working Paper 28664, April 2021.

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⁸ “Do Financial Concerns Make Workers Less Productive?” Kaur S, Mullainathan S, Oh S, Schilbach F. NBER Working Paper 28338, December 2024.

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⁹ “The Value of Communication for Mental Health,” Annan F, Archibong B. NBER Working Paper 31638, August 2023.

[Return to text](#)

¹⁰ “Mental Health Therapy as a Core Strategy for Increasing Human Capital: Evidence from Ghana,” Barker N, Bryan GT, Karlan D, Ofori-Atta A, Udry CR. NBER Working Paper 29407, October 2021.

[Return to text](#)

¹¹ “The Psychosocial Value of Employment,” Hussam RN, Kelley EM, Lane GV, Zahra FT. NBER Working Paper 28924, June 2021.

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¹² “From Micro to Macro Development,” Buera FJ, Kaboski JP, Townsend RM. NBER Working Paper 28423, February 2021, and *Journal of Economic Literature* 61(2), June 2023, pp. 471–503.

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¹³ “Search Costs, Intermediation, and Trade: Experimental Evidence from Ugandan Agricultural Markets,” Bergquist LF, McIntosh C, Startz M. NBER Working Paper 33221, December 2024.

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¹⁴ “The Incidence of Distortions,” Atkin D, Bernadac B, Donaldson D, Garg T, Huneus F. NBER Conference Paper presented at the BREAD/Development Economics Program Meeting, Fall 2025.

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¹⁵ “Mechanizing Agriculture,” Caunedo J, Kala N. NBER Working Paper 29061, July 2022.

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¹⁶ “Achieving Scale Collectively,” Bassi V, Muoio R, Porzio T, Sen R, Tugume E. NBER Working Paper 28928, June 2021, and *Econometrica* 90(6), November 2022, pp. 2603–2643.

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¹⁷ “How Important Are Investment Indivisibilities for Development? Experimental Evidence from Uganda,” Kaboski J, Lipscomb M, Midrigan V, Pelnik C. NBER Working Paper 29773, February 2022.

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¹⁸ “Transhumant Pastoralism, Climate Change, and Conflict in Africa,” McGuirk EF, Nunn N. NBER Working Paper 28243, May 2021.

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¹⁹ “Harvesting the Rain: The Adoption of Environmental Technologies in the Sahel,” Aker JC, Jack K. NBER Working Paper 29518, November 2021.

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²⁰ “The Value of Forecasts: Experimental Evidence from India,” Burlig

F, Jina A, Kelley EM, Lane GV, Sahai H. NBER Working Paper 32173, July 2025.

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²¹ “Rationing the Commons,” Ryan N, Sudarshan A. NBER Working Paper 27473, July 2020, and *Journal of Political Economy* 130(1), January 2022, pp. 210–257.

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²² “Does the Squeaky Wheel Get More Grease? The Direct and Indirect Effects of Citizen Participation on Environmental Governance in China,” Buntaine M, Greenstone M, He G, Liu M, Wang S, Zhang B. NBER Working Paper 30539, August 2023, and *American Economic Review* 114(3), March 2024, pp. 815–850.

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²³ “Food Policy in a Warming World,” Hsiao A, Moscona J, Sastry K. NBER Working Paper 32539, January 2026.

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²⁴ We uploaded the NBER Working Paper metadata (available at

<https://www.nber.org/research/data/nber-working-papers-and-chapters-metadata>) to ChatGPT 5.2 (using a professional license that does not update ChatGPT’s model with uploaded data). We refined the prompts using test data from other programs (Labor Studies and Energy and Environmental Economics) but did not run it on the Development Economics corpus until our own summary above had been finalized. The three prompts that were used for ChatGPT are as follows:

1. Please summarize the 4 most important distinct topics and themes of research in this area during the period from 2018-2025 from the NBER .dta files uploaded. You can use a numbered list and subheadings, but within each subheading please give your answers in complete paragraphs, not bullet points. Your total answer should be less than 500 words. Can you try to make the writing style engaging to the reader yet concise.

2. Which 4 themes were central in 2013-2017 that are less central in the 2021-2025 period? Use the NBER .dta files uploaded. You can use a numbered list and subheadings, but within each subheading please give your answers in complete paragraphs, not bullet points. Your total answer should be less than 250 words. Can you try to make the writing style engaging to the reader yet concise.

3. How do the main methodologies and research design approaches used in the 2021-2025 period compare to the main methodologies used 2013-2017? Use the NBER .dta files uploaded. What are key methodological advances or changes? You can use a numbered list and subheadings, but within each subheading please give your answers in complete paragraphs, not bullet points. Your total answer should be less than 250 words. Can you try to make the writing style engaging to the reader yet concise.

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Understanding the Macroeconomic Implications of Heterogeneity

Adrien Auclert, Matthew Rognlie, and Ludwig Straub

In the past decade, the widespread availability of large household- and firm-level datasets has sparked a “micro data” revolution in macroeconomics. Our research tries to understand the macroeconomic implications of this microeconomic heterogeneity by answering two key questions. First, what features of the micro data are most informative about macroeconomic outcomes? In particular, when can we find micro-sufficient statistics for these macro effects? Second, how can we make sure that our models match these moments while continuing to fit the macroeconomic data well?

In the traditional analysis of fiscal policy based on the “Keynesian cross,” the aggregate effects of government spending or transfers are determined by the *marginal propensity to consume* (MPC). For instance, the multiplier giving the effect of a fiscal transfer on GDP is $MPC/(1 - MPC)$, which includes both the direct effect of the transfer on spending and the equilibrium effect from higher aggregate income. This classic result has made the MPC a very popular object to measure, both at the aggregate and at the individual level.

However, as pointed out by Milton Friedman and Franco Modigliani in the 1950s and 1960s, the MPC concept has important limitations in a dynamic context. Since consumers are forward-looking, income today affects consumption in the future via savings, and anticipation of future income affects consumption today. In modern dynamic models, therefore, understanding consumption behavior requires going beyond the MPC to study the entire impulse response of consumption to income, which we call the “intertemporal marginal propensity to consume,” or iMPC.¹

We leverage new evidence on the iMPC from a Norwegian lottery study that tracks household consumption over several years, visualized in the dots and confidence intervals of Figure

1.² We find that the first-year MPC from receiving lottery income is high, at about 0.5—consistent with many earlier studies—but, importantly, that iMPCs also remain elevated in the second through fourth years after receiving lottery income.

The implication for the effects of fiscal transfers is that these transfers boost aggregate spending not just in the year in which they are sent, but in the next few years as well. Further, higher spending in any year will boost income in that year and therefore spending in earlier and later years. We show that, in simple modern dynamic models, this process can be captured by an “intertemporal Keynesian cross” (IKC). In the IKC, the iMPCs shown in Figure 1, together with the impulse responses of consumption to anticipated future income, turn out to be sufficient statistics for the dynamic effects of fiscal policy on output.

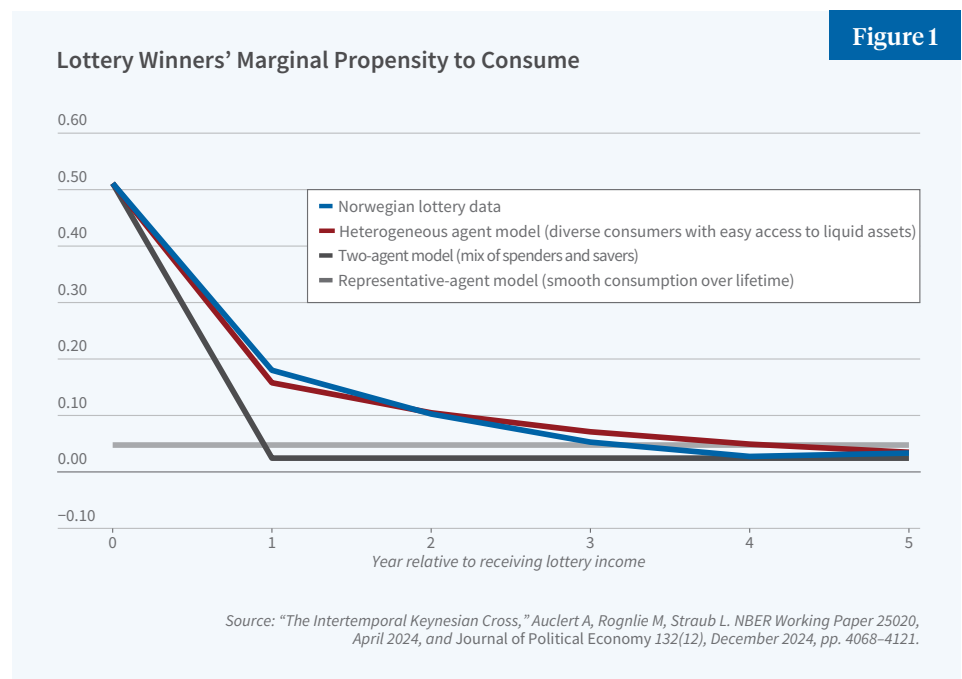
Heterogeneous-Agent Models and the Tricking-Up Process

Because evidence on anticipatory spending effects is relatively scant, and because (outside of the simple

case of the IKC) we also need to know the spending response to other shocks such as changes to interest rates, we now look for *models* that can match the iMPCs from the data. Traditional, representative-agent models are non-starters because they imply extremely low MPCs, as depicted in the light grey line of Figure 1.

It is common to match high MPCs with saver-spender models, in which a fraction of the population lives hand-to-mouth. These models can explain the high initial MPC in the data (the dark grey line in Figure 1), but not the subsequent high MPCs because the only agents saving their lottery earnings are those with very low MPCs in every period.

A model with heterogeneous agents facing income risk, borrowing constraints, and a choice between liquid and illiquid accounts matches the iMPC data much better, as shown in the red line of Figure 1. The reason for this success is that consumers in the model accumulate balances after one-off transfers as a way to smooth consumption, but then deplete these balances more quickly than in



a representative-agent model as they return to their target balances in each account. Heterogeneity in the speed at which households spend down their wealth is essential to understanding the MPC dynamics in the data.

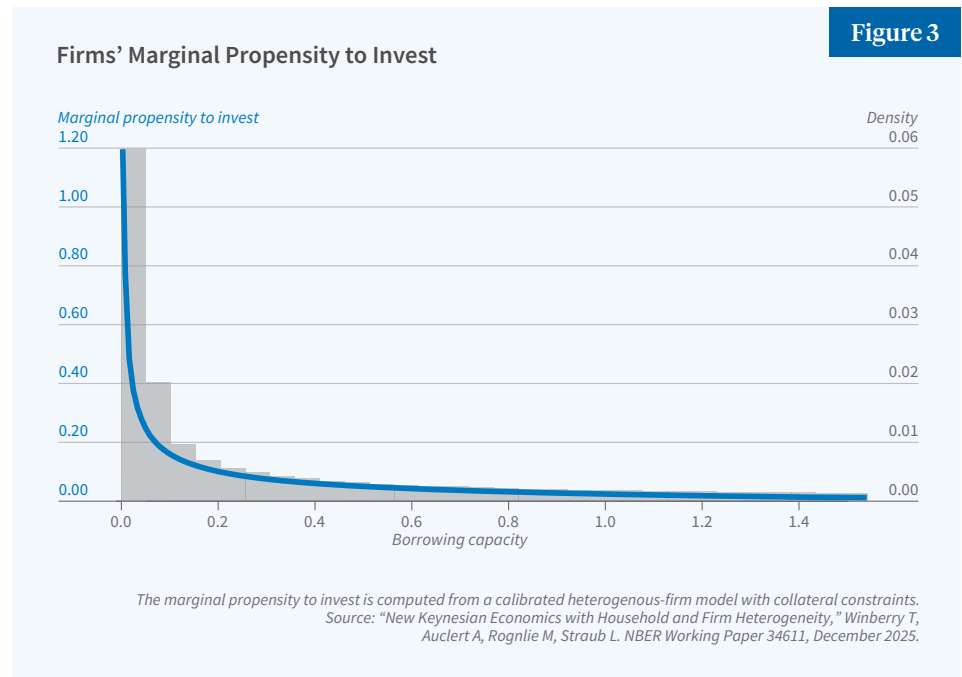
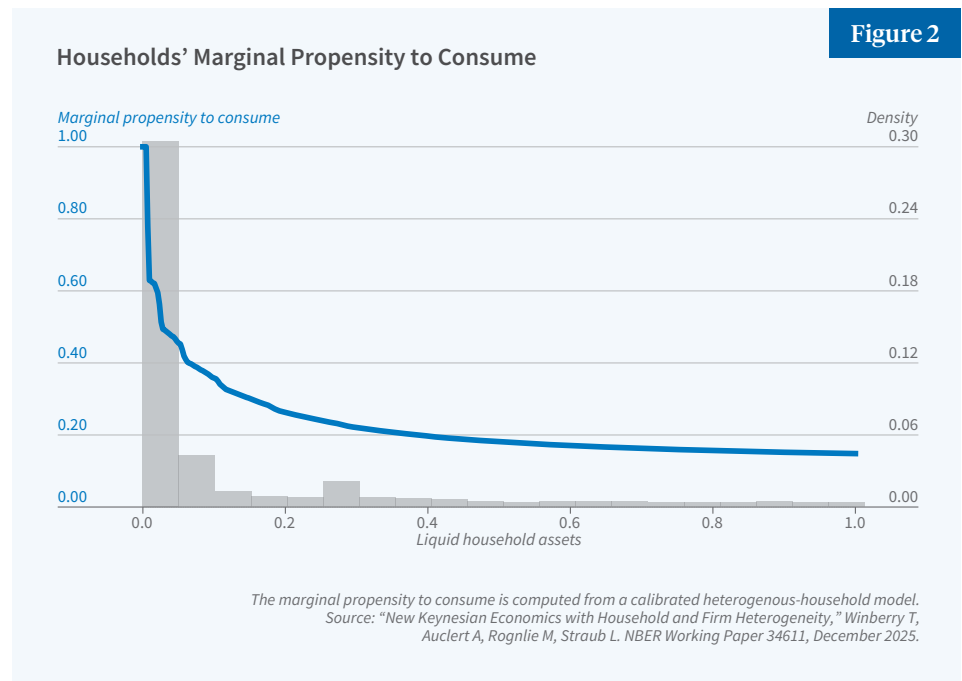
In general equilibrium, after deficit-financed transfers of the type that we saw during the recent COVID-19 recession, households who spend down their wealth the fastest—typically poorer, more constrained households—raise the income and wealth of those who do not spend as quickly. This process keeps going, with aggregate spending remaining elevated until the wealth ends up in the illiquid accounts of agents who spend near zero. This “trickling-up” process³ implies that aggregate consumer demand, and therefore inflation, can remain persistently high in the wake of large-scale fiscal transfers. Indeed, elevated inflation and robust consumer spending were observed in many countries for years after their governments sent out COVID-19 relief checks.

Monetary Policy, Micro Jumps, and Macro Humps

In the simplest version of the IKC analysis, monetary policy holds real interest rates constant when fiscal policy changes. What happens when monetary policy raises interest rates instead?

For the simplest heterogeneous-agent new Keynesian models, it is well understood that the aggregate effect of changes in monetary policy may be quite similar to that in representative-agent models.^{4,5}

But these models have a flaw with respect to the macro data: they imply an immediate reaction of aggregate consumption and GDP to monetary shocks. This prediction is at odds with most of the macro-empirical evidence on the effects of monetary policy, as well as Friedman’s famous dictum that monetary policy operates with “long and variable lags.” In order for our models to be usable for monetary policy counterfactuals, they need to match both the “micro jumps” (the high iMPCs out of income transfers from Figure 1)



and the “macro humps” (the delayed response of aggregate spending to monetary policy).

Our research shows that this can be achieved by assuming that households’ expectations of macroeconomic variables adjust sluggishly following aggregate shocks.⁶ Such departures from rational expectations are widely perceived as difficult to implement for heterogeneous-agent models, but we provide new tools to make computation tractable. The resulting framework is currently serving as a basis for hetero-

geneous-agent models at several leading central banks around the world.

With sticky expectations, the response of aggregate consumption to changes in interest rates is very small. In order to explain why monetary policy has any effect at all, we therefore need to rely on the interest-rate responsiveness of other components of aggregate demand. In our model, it is investment that plays this role: by responding to interest rates, investment affects aggregate demand and income, which ultimately drives consumption, thanks to high MPCs.

Application to Heterogeneous Firms

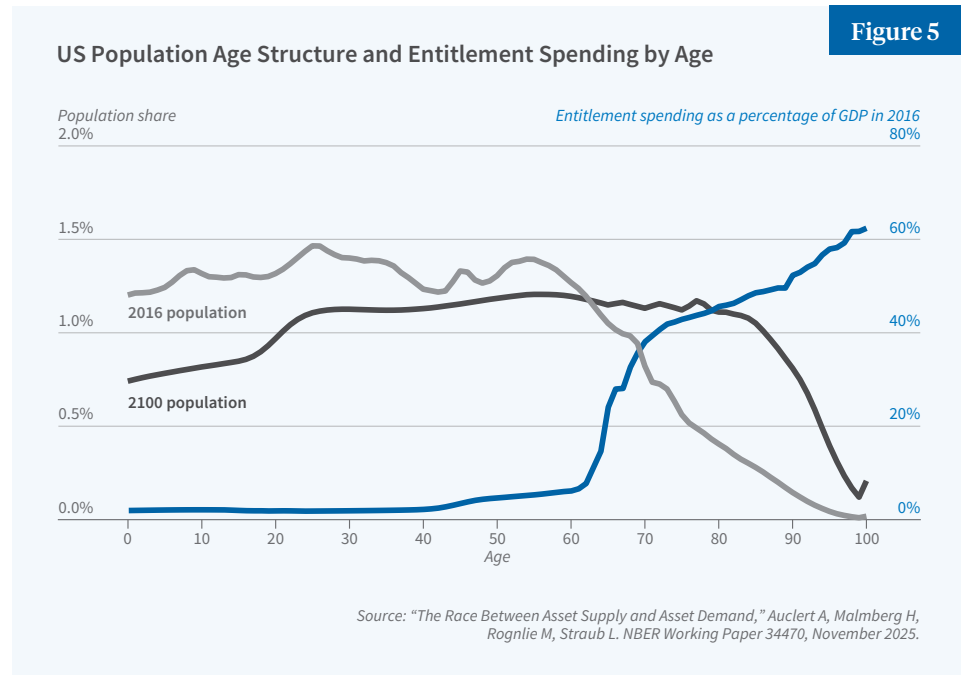
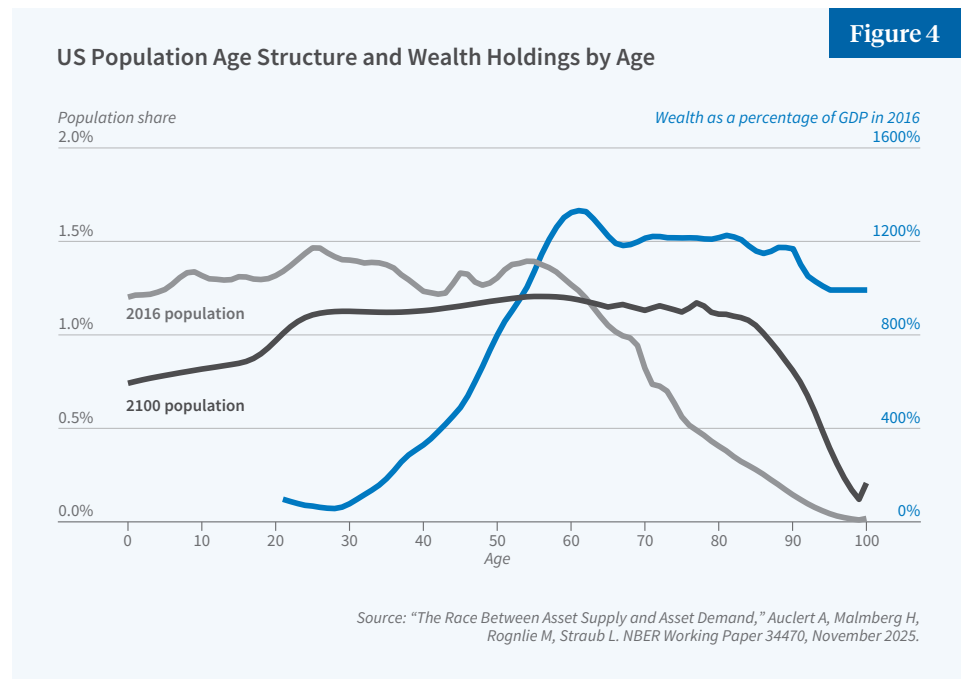
The sufficient-statistics approach to heterogeneity goes beyond its application to aggregate consumption with heterogeneous households. We can apply it, for instance, to aggregate investment with heterogeneous firms.

It is well understood that firms have heterogeneous responses to changes in their cash flows, in large part because of heterogeneity in financial constraints: some firms can easily raise additional funds, while other firms must rely on internal financing for all their investment.

We show that, for the output effects of monetary and fiscal policy, this heterogeneity can be summarized by the distribution of firms' marginal propensity to invest, or MPI—that is, the response of investment to an unexpected one-time transfer.⁷ In models with heterogeneous firms facing idiosyncratic productivity shocks, entry and exit, and financial frictions, the MPI behaves very similarly to the MPC for households: it is highest for firms near their borrowing constraints (compare the blue curves in Figures 2 and 3). In addition, just as there are many households with low liquid assets, there are many firms with low borrowing capacity (see the distributions in the gray bars of Figures 2 and 3). This implies that both the average MPC and the average MPI can be large in practice. Consequently, transfers to firms can be one way to boost aggregate demand, just like transfers to households.

Sufficient Statistics as a Solution Method

Sufficient statistics are very useful for connecting heterogeneous-agent models to micro data. But we have found that they have another benefit: they make it computationally easier to solve these models in general equilibrium. The traditional “state-space” approach keeps track of the entire distribution of heterogeneous agents in an economy, which can be prohibitively costly once we have rich heterogeneity. But in most models, agents do not directly care about the whole



distribution—they care only because of its effects on macro variables such as interest rates and wages. We summarize the macro feedbacks between these variables using “sequence-space Jacobians” and show that these are sufficient statistics for the first-order solution of heterogeneous-agent models, which can be solved very rapidly in practice.⁸

Application to Trends in Long-Run Interest Rates

The sufficient-statistics approach

to heterogeneity also goes beyond the analysis of short-run stabilization policy. We can apply it, for instance, to understanding long-run trends in interest rates.

A major hypothesis for the downward trend in real interest rates observed since the 1980s is population aging: as people prepared for long periods of retirement, they demanded an ever-increasing amount of assets. A popular thought is that this trend will reverse as baby boomers age and start to deplete their assets. We show that the effect of population aging on

aggregate asset demand and interest rates can be captured by a simple calculation that shows how many assets there will be in the future if we assume that people will accumulate the same amount of assets as they do today relative to earnings, but the age distribution shifts. This calculation is visualized in Figure 4.

We find that there will be no reversal of this wealth accumulation trend in the decades to come because there is very limited wealth decumulation at old ages. The idea that a decline in asset demand will start pushing up interest rates in the future is therefore not borne out by the data.

On the other hand, there is another major effect of demographic change: it pushes up aggregate fiscal expenditures because many large programs such as Social Security and Medicare become more generous as people age. Historically, governments have tended not to immediately raise taxes to counteract this effect, leading to deficits that can be forecast with a similar shift-share analysis, visualized in Figure 5. These deficits imply a steady increase in government debt until fiscal adjustment eventually occurs. Until such an adjustment, the supply of assets rises and puts upward pressure on interest rates.

To conclude, demographics may in fact push up interest rates in the decades to come, but if so, this will be despite plentiful savings—as high government deficits outpace individuals' increasing desire to hold assets.⁹

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² “[MPC Heterogeneity and Household Balance Sheets](#),” Fagereng A, Holm MB, Natvik GJ. *American Economic Journal: Macroeconomics* 13(4), October 2021, pp. 1–54.

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³ “[The Trickle Up of Excess Savings](#),” Auclert A, Rognlie M, Straub L. NBER Working Paper 30900, March 2023, and *AEA Papers and Proceedings* 113, May 2023, pp. 70–75.

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⁴ “[Incomplete Markets and Aggregate Demand](#),” Werning I. NBER Working Paper 21448, August 2015.

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⁵ “[Fiscal and Monetary Policy with Heterogeneous Agents](#),” Auclert A,

Rognlie M, Straub L. NBER Working Paper 32991, April 2025, and *Annual Review of Economics* 17, August 2025, pp. 539–562.

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⁶ “[Micro Jumps, Macro Humps: Monetary Policy and Business Cycles in an Estimated HANK Model](#),” Auclert A, Rognlie M, Straub L. NBER Working Paper 26647, January 2020.

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⁷ “[New Keynesian Economics with Household and Firm Heterogeneity](#),” Winberry T, Auclert A, Rognlie M, Straub L. NBER Working Paper 34611, December 2025.

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⁸ “[Using the Sequence-Space Jacobian to Solve and Estimate Heterogeneous-Agent Models](#),” Auclert A, Bardóczy B, Rognlie M, Straub L. NBER Working Paper 26123, March 2021, and *Econometrica* 89(5), September 2021, pp. 2375–2408.

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⁹ “[The Race Between Asset Supply and Asset Demand](#),” Auclert A, Malmberg H, Rognlie M, Straub L. NBER Working Paper 34470, November 2025, and presented at the *Proceedings of the 2025 Jackson Hole Economic Policy Symposium*.

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Intergenerational Effects of Welfare Reform

Hope Corman and Dhaval Dave

In a research program with colleagues Nancy E. Reichman at Rutgers University and Ariel Kalil at the University of Chicago, we have been investigating the effects of public assistance retraction on the next generation. We have focused on the 1996 US Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) and on state waivers in the early 1990s, collectively referred to as welfare reform, one of the most sweeping social policies of the twentieth century. This legislation reflected a growing consensus that public assistance is a cause of dependence rather than a consequence of disadvantage. Key pillars of welfare reform were work requirements and lifetime limits on welfare participation, both of which are strong work incentives. The logic was that labor force participation would eliminate a “culture of poverty” by increasing self-sufficiency and reconnecting members of an increasingly marginalized underclass to the mainstream ideals of a strong work ethic and civic responsibility.

Since the reforms, welfare caseloads have plummeted (Figure 1) and employment of low-skilled women has increased (Figure 2); these patterns reflect the time limits and work requirements mandated by the PRWORA legislation. Our work shows that welfare reform led to decreases in women’s substance use and crime, as well as increases in women’s voting (an indicator of civic engagement), suggesting that welfare reform has brought low-income mothers from the margins to the mainstream.^{1,2,3} However, we also found that welfare reform reduced adult women’s college attendance and full-time vocational schooling.^{4,5} If work and education are complements, these findings suggest risks for women’s economic trajectories. Moreover, prior research has found that while welfare reform increased income and reduced poverty among low-income mothers on average, women at the very bottom of the income distribution or without a high school education did not benefit and

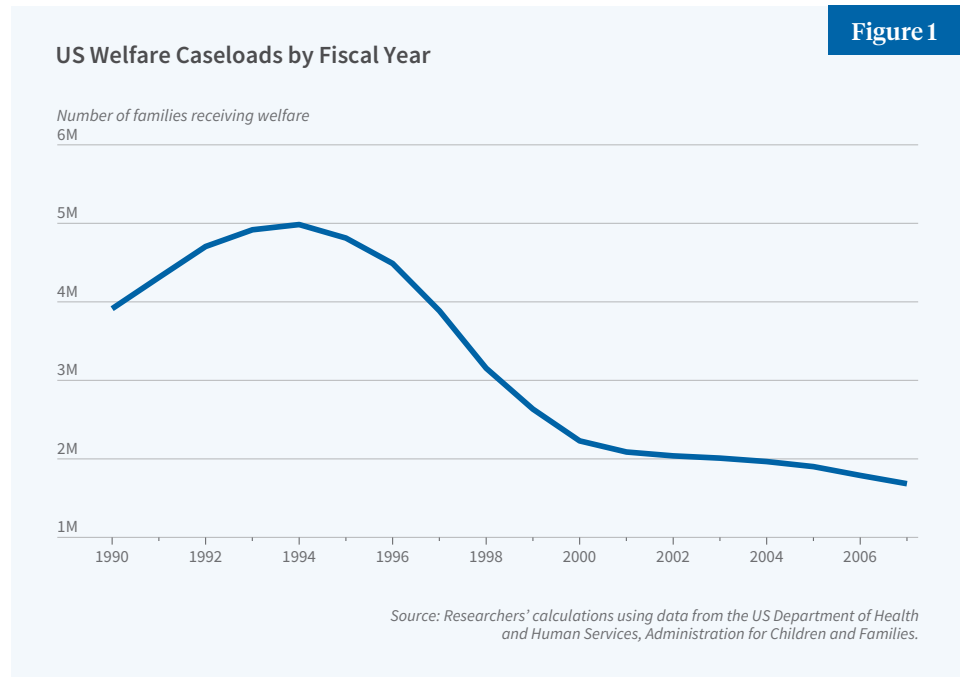


Figure 1

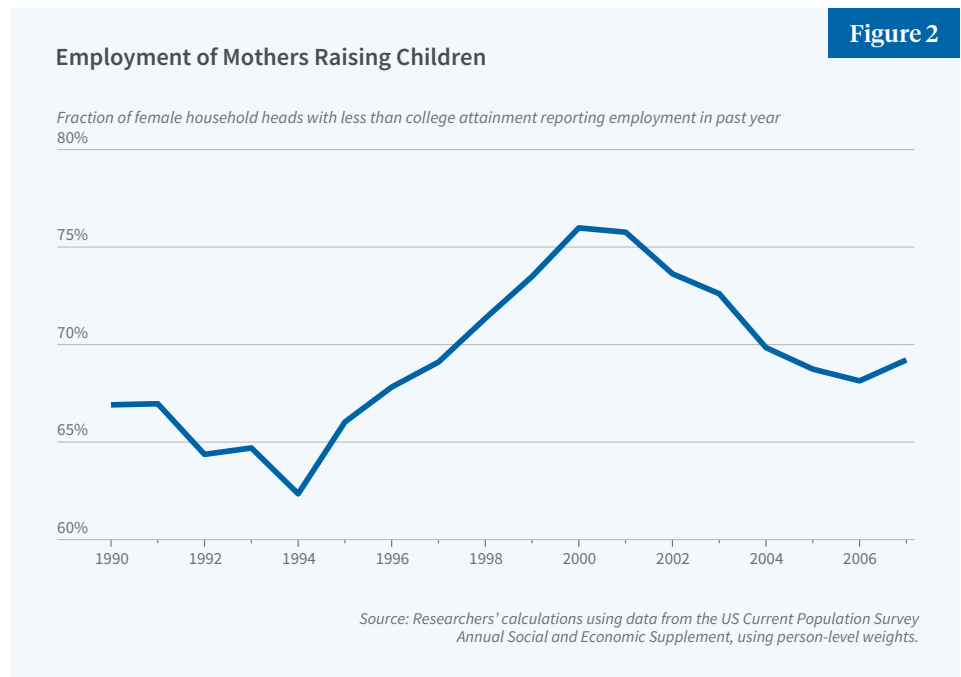


Figure 2

may have even fallen further behind.

Another assumption underlying welfare reform was that the work-focused regime would break an assumed intergenerational transmission of welfare dependence. Studies found that welfare reform led to decreased high school dropout rates among girls and decreased teen fertility, at least in part through its “minor mother” requirements that mothers under 18

participate in education or training activities and live with a parent or guardian. If increases in education and decreases in fertility improve socioeconomic trajectories, these findings suggest that strong work incentives can interrupt the intergenerational association in welfare dependence between mothers and daughters.

Our research further tested whether welfare reform could put children on

a path to self-sufficiency by examining its effects on adolescent behaviors associated with subsequent adult economic and health outcomes. Economic theory suggests that adolescents' behavior will be responsive to strong work incentives under welfare reform, but the expected direction is ambiguous. On the one hand, increased family resources and human capital resulting from maternal employment may increase maternal investment in the wellbeing of children. Welfare reform may also increase the modeling of socially desirable behaviors, such as working and volunteering, and health-promoting behaviors, such as healthy eating and adequate sleep. As such, we would expect welfare reform to lead to decreases in risky and delinquent behaviors and increases in socially desirable and health-promoting behaviors of adolescents. On the other hand, the strong work incentives under welfare reform may reduce the quantity or quality of adult supervision of teenage children, which would decrease the costs to the teens of engaging in risky and delinquent behaviors while also decreasing the cost of avoiding some socially desirable and health-promoting behaviors. Prior research in psychology and economics suggests that changes in household circumstances affect boys' behavior more than girls' and that early childhood (ages 0–5) is a sensitive period for parental input and household circumstances. As such, the effects of welfare reform on adolescent behaviors may vary by gender, age, and duration of exposure.

Two of our studies exploited differences in the implementation of welfare reform across states and over time to identify plausibly causal effects on criminal arrests among teens ages 15–17. Using data from the FBI's Uniform Crime Reporting we assessed the extent to which teen arrests changed during the period from 1990 (before any welfare reform was in effect) to 2005 (when welfare reform had been fully implemented).^{6,7} We found that welfare reform led to increases in drug-related arrests with effects that appeared to be stronger for boys than girls, decreases in arrests for minor crimes (e.g., disor-

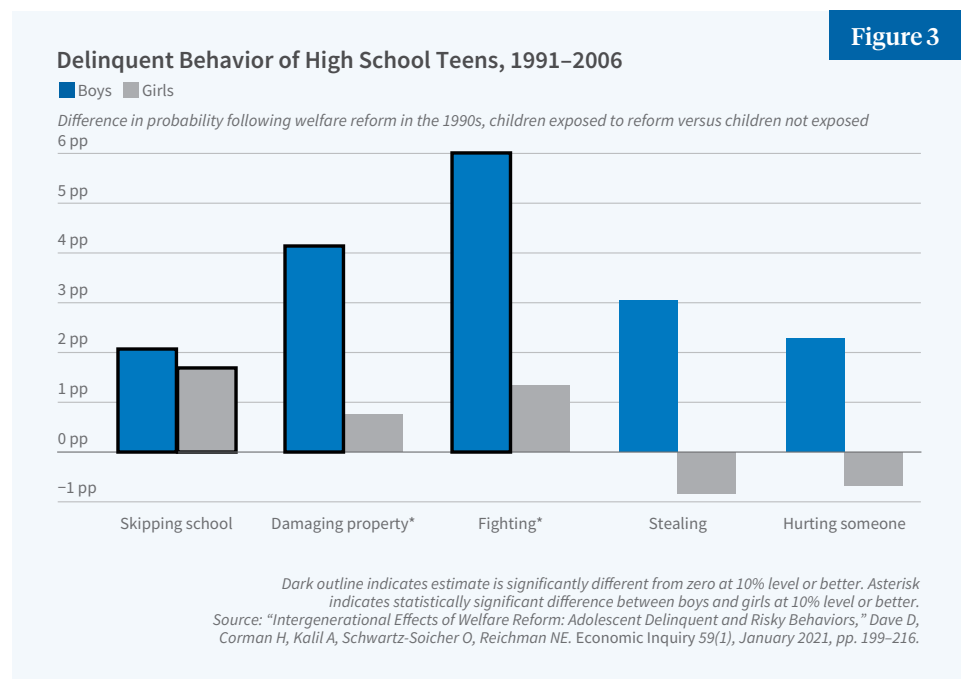
derly conduct, curfew and loitering law violations) with similar estimates for boys and girls, and no changes in arrests for serious violent or property offenses.

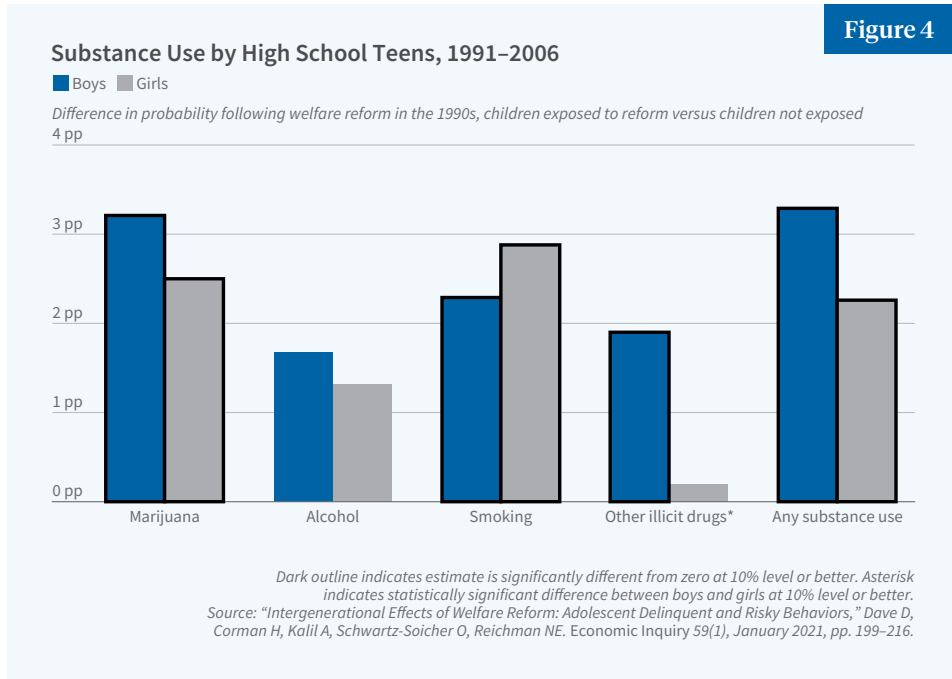
The effects on arrests could potentially reflect welfare reform–induced changes in reporting of teen crime rather than teens' behavioral responses. To address this possibility and to explore youth behavior directly, we used 1991–2006 data from Monitoring the Future and difference-in-differences methods to estimate the effects of welfare reform on self-reported delinquent and substance use behaviors by gender among high school students.⁸ Figure 3 shows the effects of welfare reform on skipping school, damaging property, fighting, stealing, and hurting someone. These adolescent behaviors do not necessarily constitute crimes, but are often precursors to adult criminal behavior. Welfare reform increased boys' delinquent behaviors, with significant effects for skipping school, damaging property, and fighting. In contrast, the effects of welfare reform on girls were minimal, with a significant (positive) effect only for skipping school. Figure 4 shows the effects of welfare reform on substance use behaviors. Welfare reform increased substance use among both boys and girls, with significant effects for marijuana use, cigarette smoking, and any substance

use. The increases were almost uniformly larger for boys than for girls, and there was a significant increase in other illicit drugs for boys. All told, welfare reform increased teens' delinquency and substance use, with boys particularly affected.

Using the same data, we also investigated the extent to which welfare reform was associated with teenagers' positive health and social behaviors.⁹ Positive health behaviors included regularly eating breakfast and fruits and vegetables, exercising, and getting adequate sleep. Positive social behaviors included doing homework, completing assignments, volunteering, participating in athletics and other extracurricular activities, and regularly attending religious services. We found no evidence that welfare reform affected any of these behaviors, leading us to conclude that the effects of welfare reform on teenagers were on net negative, particularly for boys.

Overall, we found no evidence of welfare reform effects on positive youth behaviors, but considerable evidence that it affected negative ones and that the negative effects were generally much larger for boys than girls. Potential explanations for the gender differences are that disruptive events take more of a toll on boys, perhaps through differential responses to welfare





explain the pattern of stronger negative effects of welfare reform on boys.

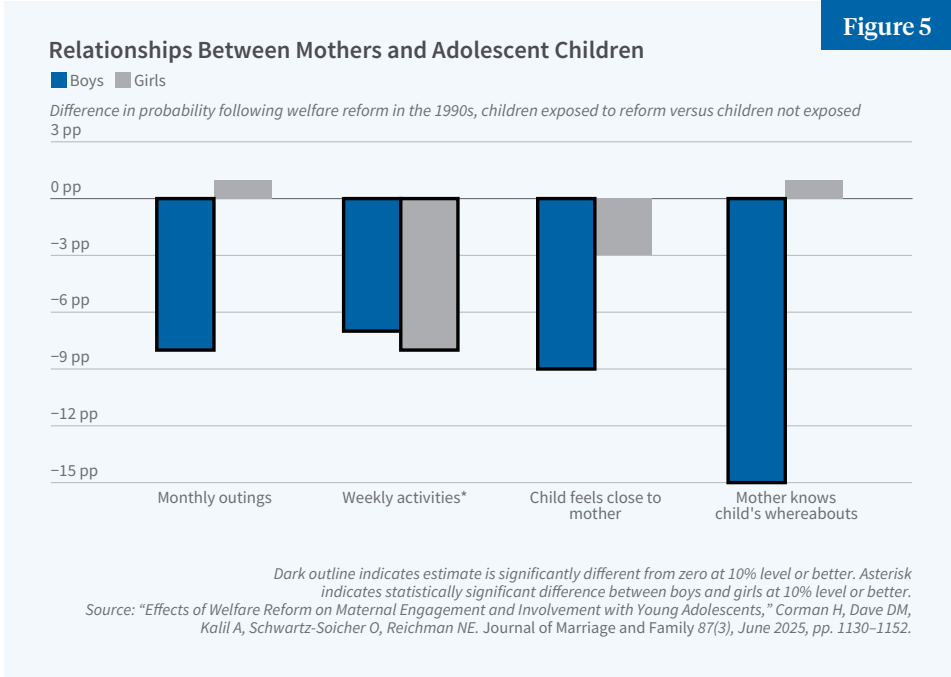
More recently, as the cohort of children exposed to welfare reform has come of age and data have become available, we expanded our focus to next-generation adults. We focused on food insecurity, a fundamental form of hardship linked to health. Using data from the Panel Study of Income Dynamics, we found that exposure to welfare reform during childhood substantially reduced the incidence of food insecurity in adulthood (by about 10 percent for a five-year increase in exposure), but only among women.¹² We found much smaller and less consistent effects of childhood exposure to welfare reform on food insecurity in adulthood for men.

Overall, the findings from our research program suggest that while welfare reform had positive effects on women's employment, crime, and substance use and on teenage girls' high school dropout rates and fertility, there were negative intergenerational effects on adolescent delinquent behaviors and substance use for boys. We also found that welfare reform reduced next-generation adult food insecurity (a positive outcome), but mainly for girls. Thus, it appears that the gains from welfare reform have come at a cost to the next generation of boys, who have been falling behind

reform—associated maternal stress/anxiety, conflict between parents and children, or parental disengagement; that boys and girls at the same age have different levels of maturity or impulsivity; and that there were differential effects of welfare reform on household composition, place of residence, or peer groups.

In all our work, we have strived to identify explanatory mechanisms. Two of our studies focused on the effects of welfare reform on parenting quality and family dynamics; these are important outcomes in their own right and potential mediators of welfare reform's effects on adolescent behaviors. The first study, using linked mother-child data from the National Longitudinal Survey of Youth 1979 (NLSY79), focused on the quality of the home environment for preschool-aged children, and the second study, also using data from the NLSY79, focused on maternal engagement and involvement with their young teenagers.^{10,11} Among young children, welfare reform did not affect the time and material resources mothers devoted to cognitively stimulating activities, but it decreased mothers' emotional support in parent-child interactions, suggesting a potential mechanism underlying welfare reform's effects on adolescent delinquent and health-risk behaviors—early childhood origins of

adolescent functioning. In the second study we looked at teens' reports of activities they engaged in with their parents, their perceived closeness to their mothers, and whether mothers monitored their behavior. The results, shown in Figure 5, indicate that welfare reform decreased the quality of parent-child interactions across multiple dimensions for boys but had little effect for girls. All told, these results suggest that welfare reform disrupted mothers' relationships with and emotional support for their children, particularly their sons, which may



girls in terms of high school completion. More generally, the findings from this research underscore that large-scale social policies can have substantial unintended effects that cross generations.

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¹¹ [“Effects of Welfare Reform on Maternal Engagement and Involvement with Young Adolescents,”](#) Corman H, Dave DM, Kalil A, Schwartz-Soicher O, Reichman NE. NBER Working Paper 28077, November 2020, and *Journal of Marriage and Family* 87(3), January 2025, pp. 1130–1152.
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Hope Corman

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Incentives Matter in Schools

Eric A. Hanushek and Steven G. Rivkin

This short summary describes our research on educator incentive programs in the Dallas Independent School District (DISD). Minh Nguyen, Ben Ost, and Andrew Morgan are co-authors on both studies completed for this project, and Jin Luo and Ayman Shakeel are coauthors on one of the studies.

Past studies consistently show the substantial impact of effective teachers at raising students' achievement and their future earnings.¹ Yet, as US schools search for approaches to ameliorate pandemic learning losses and to improve overall student performance, this general research finding has had little influence on efforts to improve outcomes in the vast majority of districts and states. In fact, there is little consensus about effective school improvement policies that can be taken to scale, particularly for the most disadvantaged schools. Importantly, our research on the dramatic personnel reforms introduced in the DISD suggests that standard economic solutions that recognize the importance of incentives and working conditions can provide a basis for a revitalized education system.

The DISD story begins when Mike Miles was appointed DISD superintendent in 2012 and immediately embarked on an overhaul of the long-standing evaluation and pay systems that gave high marks to most educators and produced little relationship between job performance and compensation. The district introduced two sets of reforms to its personnel system—the Principal Excellence Initiative (PEI) in 2013, and the Teacher Excellence Initiative (TEI) in 2015. Both employed new evaluation systems and revised pay schedules to match the evaluations. The TEI was more radical because it replaced a rigid system that based salaries on teacher experience and teacher degree level, two factors that bear limited relationship to student outcomes. Principal contracts were always more flexible than those for teachers, although PEI introduced clear incen-

tives related to student achievement.

DISD then leveraged the pay-for-performance system to offer salary inducements to attract and retain highly effective educators in the district's lowest achievement schools. Although past attempts to use monetary incentives to attract teachers to the most disadvantaged schools had generally not led to higher student achievement, the typical program offered modest stipends that were not based on demonstrated teacher effectiveness. When DISD introduced the Accelerating Campus Excellence (ACE) program, it included stipends based on prior performance that could increase salaries by up to \$10,000 per year. This induced many of the most highly rated teachers to move to and remain in the lowest performing schools in the district for as long as the bonuses lasted.

Our two studies that evaluate the effects of TEI and ACE, respectively, offer direct evidence that 1) appropriately structured incentives based on student performance can lead to significant system-wide improvement in outcomes in large urban school districts; and 2) it is possible to quickly and decisively raise the achievement of the lowest performing students with large, targeted salary inducements for highly effective educators. Within two years, average achievement in the ACE elementary schools exceeded the district average. When the incentives were removed after three years, however, many highly effective teachers left, and school performance declined substantially. Importantly, Superintendent Miles left the district in 2015, just as TEI and ACE were getting underway, so these results speak to the power of the reforms and not just to the skills and charisma of the reformer.

The Impact of District-Wide Performance Incentives

We investigate the effects of TEI on math and reading achievement in the DISD.² TEI introduced a multimea-

sure evaluation system that combined a student achievement component, a performance component primarily based on supervisor observations of teaching, and a survey component based on feedback from students in second grade and higher. Student achievement came from the standardized state tests, while the structured observational component involved ten 10–15 minute spot observations and one 45-minute extended observation per year. Importantly, the previously introduced PEI placed considerable weight on principal effectiveness at supporting teachers. Together, the systems incorporate features designed to mitigate arbitrary judgments by principals, reward teamwork, and support low-achieving children: TEI bases a portion of the teacher achievement component on the school average, and PEI penalizes principals whose subjective evaluations of teachers diverge from student achievement growth and rewards the closing of the achievement gap.

The TEI score constitutes the primary determinant of teacher salary with some downward protections for incumbent educators at the time of the reform, limits on movement among categories, and additional requirements for reaching the highest salary levels. Table 1 shows the salaries and target distribution for teachers in each category in 2015. The fixed distributions across categories protect the budget from evaluation inflation.

Estimating the effects of TEI requires identifying an appropriate comparison district. As the second largest district in Texas with almost 160,000 students in 2015, DISD has no natural comparison district in Texas. Potential comparison districts of similar size and student composition outside of Texas would not be subject to the same state education regulations and financing or take the same standardized test. This leads us to use synthetic control methods to estimate the time trend of what DISD achievement would have been in the absence of the reforms. Specifically, we construct

Table 1

Teacher Salaries & Target Distribution for Teacher Performance Categories, 2015

	Unsatisfactory	Progressing		Proficient			Exemplary		Master
		I	II	I	II	III	I	II	
Average salary	\$45k	\$49k	\$51k	\$54k	\$59k	\$65k	\$74k	\$82k	\$90k
Target distribution	3%	12%	25%	40%	12%	6%	2%		0%

Source: "The Effects of Comprehensive Educator Evaluation and Pay Reform on Achievement," Hanushek EA, Luo J, Morgan AJ, Nguyen M, Ost B, Rivkin SG, Shakeel A. NBER Working Paper 31073, March 2023, and forthcoming in Journal of Urban Economics.

a comparison school for each of the schools in Dallas by taking a weighted average of all other schools in Texas where at least 60 percent of students have incomes that are low enough to make them eligible for a subsidized lunch. The weights are chosen to minimize the pretreatment difference in outcomes between each DISD school and its synthetic control school for the years 2004–12. We then aggregate DISD and control schools to the district level and compare the pattern of achievement before and after the introduction of TEI in 2015.

The left panel of Figure 1 illustrates the substantial effect of TEI on district-wide math achievement that increases to approximately 0.1 standard deviations by 2019. This is an educationally and economically large effect that compares favorably with expensive interventions including the reduction of elementary school class size. Importantly, Dallas and the synthetic control district have similar math scores in 2013 and 2014, years not used in the matching algorithm. This provides evidence of common pretreatment trends in the DISD and comparison schools that supports the validity of the comparison groups.

Any potential comparison schools in suburban or rural communities could be problematic if schools in these districts experience systemically different economic, social, and policy shocks than those in large Texas districts including DISD. We therefore assess the robustness of our estimates to restricting the donor pool to the largest districts and find that the treatment effects increase as the donor pool becomes more restrictive. The 2019 coefficient increases from 0.1 with the unrestricted donor pool of

schools from high-poverty districts to 0.18 with a donor pool of schools from the 10 largest high-poverty districts.

The right panel of Figure 1 reveals a different pattern for reading with smaller and statistically insignificant effects. Effect sizes for reading do increase and become significant by 2019 as the donor pool becomes more restrictive, but the insignificant effects in the less restricted donor pools lead us to be cautious in making any claim regarding reading improvement. Note that the larger impact of schools on math compared to reading is consistent with prior evidence, a result often attributed to parents having a greater impact on reading than on math achievement.³ But it may also reflect larger variation in teacher effectiveness at math as opposed to reading instruction.

TEI strengthens incentives for current teachers, provides abundant

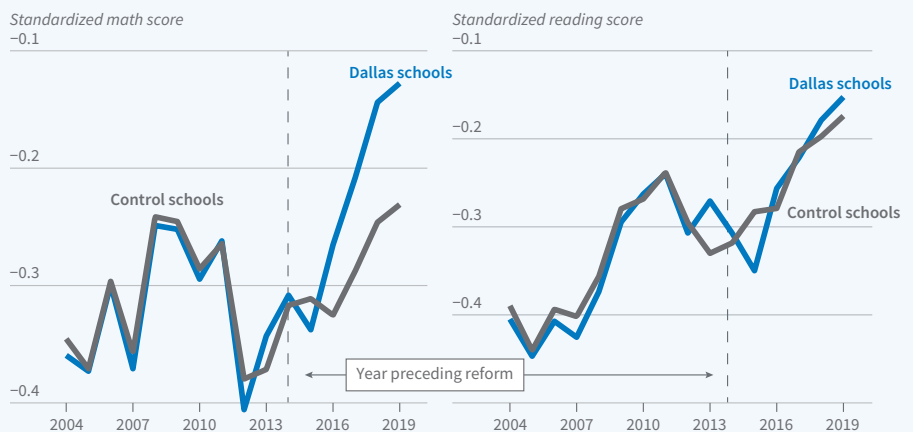
information for teacher development, and makes the district a more desirable place for more effective teachers who earn higher salaries, all of which can contribute to the growth in achievement. We find that most of the improvement in math scores results from changes in the composition of the DISD teaching force. Those teachers who leave the district are, on average, substantially less effective than the peers who remain.

Improving Poorly Performing Schools

A wide range of programs designed to improve the quality of instruction for disadvantaged students at traditional public schools have been implemented, but the overall record has been underwhelming. Moreover, when programs appear successful, it is difficult to extract what elements are most important. Dallas addressed the challenge of improving its poorest performing schools by using financial incentives to attract and retain highly effective educators in schools with the lowest student achievement. Our analysis finds that the ACE program produced dramatic and lasting achievement increases.⁴

ACE provided annual stipends for moving to one of the ACE schools ranging from \$6,000 for a Progressing teacher to \$10,000 for an Exemplary

Teacher Evaluation, Pay-for-Performance Reforms, and Student Achievement



DISD adopted a payment performance reform heading into the 2015 academic school year. Source: "The Effects of Comprehensive Educator Evaluation and Pay Reform on Achievement," Hanushek EA, Luo J, Morgan AJ, Nguyen M, Ost B, Rivkin SG, Shakeel A. NBER Working Paper 31073, March 2023, and forthcoming in Journal of Urban Economics.

Figure 1

or Master teacher. The program was initially rolled out in four elementary schools in 2016 (ACE 1) and then an additional five elementary schools in 2018 (ACE 2). In 2019, DISD scaled back the intervention for three of the four ACE 1 elementary schools with the fourth being assigned to the new ACE cohort. The ACE program replaced all the principals and required all prospective teachers for the targeted schools, including existing teachers, to apply for jobs.

The district selected the lowest performing schools in 2014 to receive the ACE treatment in 2016, and we use the next lowest performers as controls. Although control group schools initially performed slightly better than the ACE schools, they followed similar pretreatment trends.

A common narrative about US schools is that teachers do not respond to incentives, but this is not what we observe in the DISD. The left panel of Figure 2 shows that ACE substantially improved the distribution of teacher effectiveness, measured in the year prior to ACE implementation. Before the program, teacher ratings in the soon-to-be ACE schools are concentrated in the lower part of the distribution, but following program adoption and replacement of roughly 80 percent of the teachers, the distribution of teacher ratings in the ACE schools based on their effectiveness measured in the same pretreatment year moves sharply to the right. By comparison, the distribution of teacher ratings in control schools barely changed over the period (right panel).

Shifts in the teacher evaluation distribution do not constitute direct evidence of the success of ACE. We adopt a difference-in-differences approach that compares the performance of ACE schools to that of the control schools to estimate the effects of ACE on achievement.

What happened to student achievement? Figure 3 plots the estimated effects of ACE on math and reading achievement, showing large treatment effects of around 0.5 standard deviations in math and 0.35 standard deviations in reading for 2016–18, the three program years.

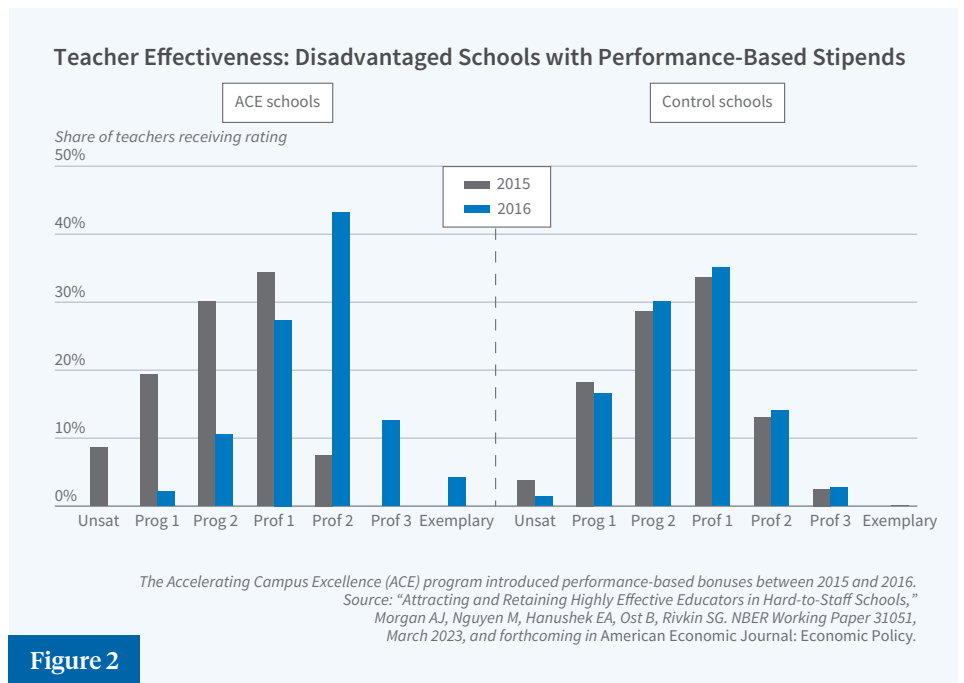


Figure 2

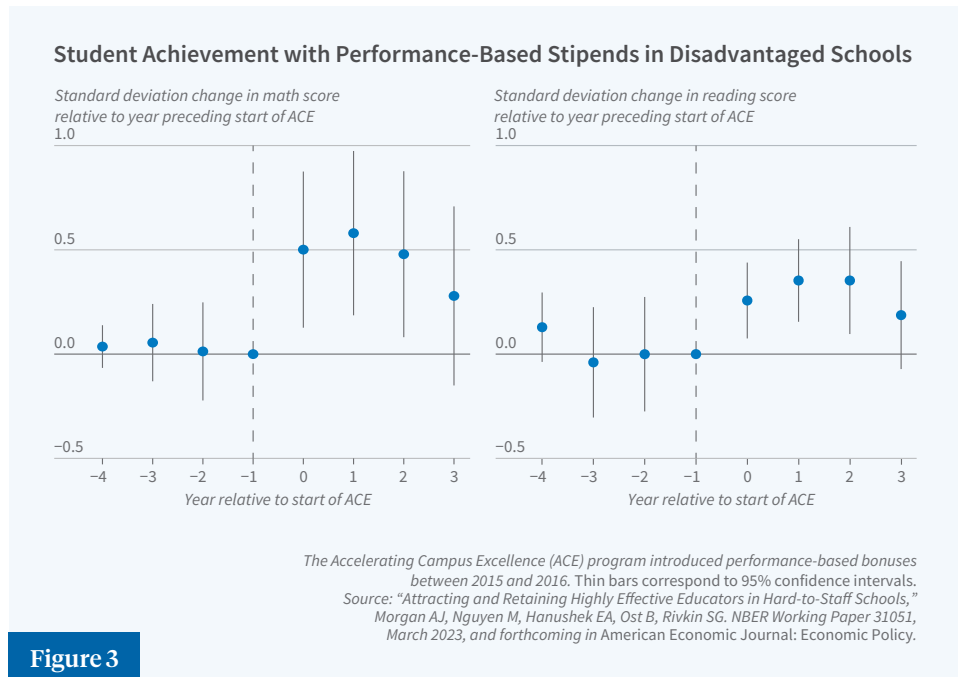


Figure 3

This takes achievement in the ACE schools from the bottom of the DISD distribution in 2015 to the district average in math and slightly below the district average in reading.

The subsequent substantial declines in math and reading achievement in 2019 show clearly the importance of the salary stipends linked with effectiveness. Because the initial cohort of ACE schools did so well, most of the monetary rewards for teachers were eliminated in 2019. Almost half of the more effective teachers with the highest ratings left

the ACE schools after 2018, with most moving to another DISD school. By comparison, over 80 percent had remained in an ACE school following the 2017 school year. Only 10 percent of the lower-rated teachers left the ACE school following the loss of stipends.

When we follow ACE students out of their elementary schools into middle schools, the event-study estimates suggest that students who were in ACE elementary schools for at least two years had substantially higher middle school math achievement. This

indicates that the impacts reflected true foundational learning rather than strategically teaching to the test.

Although a cost-benefit analysis is difficult to do with precision, our estimates indicate that the \$1,000 of stipend costs for the ACE program return some 17 times that cost in terms of student lifetime earnings. Alternatively, the ACE expenditures yield substantially greater achievement gains than existing estimates for class size reductions or for high-dosage tutoring.

The ACE intervention also included additional instruction time, an enhanced after-school program, and some other components, but 85 percent of program costs went towards the salary enhancements. The impacts for the second cohort of ACE schools treated in 2018 are quite similar. We nonetheless focus on the first cohort because we can observe students following their entry into middle school and observe schools post-treatment.

Some Conclusions and Interpretations

Our evaluations suggest that the DISD personnel reforms had a dramatic effect on the quality of instruction and achievement.

Having a credible evaluation system in place permitted the introduction of performance-based incentives to get highly effective teachers to teach in the lowest performing schools. Contrary to a general pessimism about the possibility of improving schools serving the most disadvantaged

students in major cities, this policy demonstrates that teachers respond to incentives and that the most effective teachers can turn around the lowest performing schools.

A common argument against this type of incentive program is one of political resistance that introduces inertia into school institutions, making it difficult to produce meaningful changes. For example, Race to the Top (RTT)—the federal initiative to expand high-stakes teacher evaluation—failed to induce the adoption of high-stakes reforms that included meaningful salary differences connected with performance. The design of the incentive structure likely contributed to its lack of success in raising the quality of instruction and achievement.⁵

Incentives provide a possible answer to the general problem of resistance to substantial institutional change. The Texas legislature, impressed by early results from Dallas, introduced a state incentive program in 2019 that provides grants to districts that are willing to have evaluations based on student achievement and that assign effective teachers where they are most needed, a more demanding standard than that included in RTT. By 2025, more than half of Texas districts had applied for state funds to provide effectiveness-based rewards to teachers.⁶ An evaluation of teacher effectiveness and achievement under this Texas incentive program will provide crucial information for the crafting of improved legislation in the future.

¹ “The Pandemic in Perspective: US Learning Losses in the Twenty-First Century,” Hanushek EA. *Hoover Education Success Initiative*, September 2025.

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² “The Effects of Comprehensive Educator Evaluation and Pay Reform on Achievement.” Hanushek EA, Luo J, Morgan AJ, Nguyen M, Ost B, Rivkin SG, Shakeel A. NBER Working Paper 31073, March 2023, and forthcoming in the *Journal of Urban Economics*.

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³ “Generalizations about Using Value-Added Measures of Teacher Quality,” Hanushek EA, Rivkin SG. *American Economic Review* 100(2), May 2010, pp. 267–271.

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⁴ “Attracting and Retaining Highly Effective Educators in Hard-to-Staff Schools,” Morgan AJ, Nguyen M, Hanushek EA, Ost B, Rivkin SG. NBER Working Paper 31051, March 2023, and forthcoming in *American Economic Journal: Economic Policy*.

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⁵ “Taking Teacher Evaluation to Scale: The Effect of State Reforms on Achievement and Attainment,” Bleiberg J, Brunner E, Harbatkin E, Kraft MA, Springer MG. NBER Working Paper 30995, March 2023.

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⁶ “2024–25 Teacher Incentive Allotment Annual Report,” Teacher Education Agency.

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Eric Hanushek

Eric Hanushek is the Paul and Jean Hanna Senior Fellow at the Hoover Institution of Stanford University and a leading scholar in the economics of education. He is a research associate in the NBER’s Economics of Education, Children and Families, Public Economics, and Labor Studies programs. In 2021, he received the Yidan Prize for Education Research, the field’s most prestigious international award. With the prize money he founded the Africa Fellows in Education Program, a capacity-building program focused on improving education policy in sub-Saharan Africa. Hanushek has authored or edited 26 books and more than 300 articles and is a fellow of both the Society of Labor Economists and the American Educational Research Association. His public service has included roles as a commissioner on the US Department of Education’s Equity and Excellence Commission, chair of the National Board for Education Sciences, deputy director of the Congressional Budget Office, and member of the National Assessment Governing Board. A member of the National Academy of Education and the International Academy of Education, he earned his PhD in economics from MIT after graduating as a Distinguished Graduate of the US Air Force Academy.

Steven Rivkin

Steven Rivkin is professor in and head of the Department of Economics at the University of Illinois Chicago, a research associate in the NBER's Economics of Education program, and a fellow at CESifo research institute in Germany and the International Academy of Education. He is the author of many studies on educator effectiveness and labor markets, educator effectiveness and labor markets, educator evaluation and compensation reforms in large urban districts, charter schools, school desegregation, accountability, class size reduction, peer influences, the geography of academic mobility, and instruction time. His work focuses on the United States, but he has also written on education in Chile and central Europe. His recent work focuses on educator and school effects on post-secondary outcomes including engagement with the criminal justice system. Rivkin has served on numerous government advisory committees and task forces and was a member of the Amherst College and Amherst Regional School Boards. He received his BA from the University of Michigan and his PhD in economics from the University of California, Los Angeles.

Worker Voice and Firm Governance

Simon Jäger and Benjamin Schoefer

What happens when workers get a formal seat at the table in corporate governance? In many European countries, laws require that worker representatives serve on company boards and participate in management decisions, a shared governance system known as codetermination. Germany's version, dating to the post-war era in its current form, is perhaps the most prominent: workers elect representatives to corporate supervisory boards, and establishment-level works councils participate in day-to-day workplace decisions. During its long history, codetermination has regularly attracted attention in countries that typically exclusively rely on shareholder control, such as the United States or the United Kingdom. The central question for economists is whether giving workers formal representation in firm governance meaningfully affects wages, productivity, and investment—and if so, in which direction—or whether it primarily affects only subjective (but arguably important) outcomes, such as workers' sense of voice and dignity. Over the past several years, we have pursued a research agenda examining this question, combining quasi-experimental reform-based research designs in Germany and Finland with cross-country analyses. Our empirical findings point to a nuanced pattern: codetermination is a moderate institution, one that neither dramatically raises wages nor harms firms through reduced investment, but whose effects depend importantly on institutional design. It might have different effects depending on the overall institutional environment it is embedded in. And open questions include effects on financial performance, innovation, subjective outcomes, and, importantly, its aggregate equilibrium effects.

The German System of Industrial Relations

To understand codetermination, it helps to understand the broader institutional landscape in which it

operates. In a recent overview, we describe the “German model” of industrial relations as resting on two pillars.¹ The first is sectoral collective bargaining—with the twist of employer choice: industry-level unions and employer associations negotiate collective bargaining agreements that set wage floors and working conditions for entire sectors and regions. But rather than accepting the imposition of wage floors on all firms through mandatory coverage or through widespread extensions of those agreements to all employers, German employers can decide whether to accept these wage floors or to retain wage-setting flexibility. As of 2020, about 52 percent of German workers were covered by such agreements—far above the roughly 6 percent private-sector coverage rate in the United States but far below the coverage rate in Italy or the Nordic countries, for example, even though only 15 percent of German workers belong to a union. This institutional architecture differs starkly from the American system of employer-level bargaining: In the United States, coverage and membership nearly coincide, collective bargaining agreements do not allow for upward wage flexibility, union voice in management decision-making is largely curtailed, and employer resistance to unionization is common.

The second and less-studied pillar is firm-level codetermination. It operates through two channels. Under *board-level* codetermination, workers in larger firms elect representatives to the corporate supervisory board—the body that appoints and monitors the executive board. Firms with 500 to 2,000 employees must allocate one-third of supervisory board seats to workers; firms with more than 2,000 employees must allocate one-half, though shareholders retain a tie-breaking vote. Through *shop-floor* codetermination, workers in any establishment with at least five employees may elect a works council with co-decision-making rights over working hours, leave schedules,

monitoring, and dismissal procedures. About 40 percent of German workers are covered by works councils.

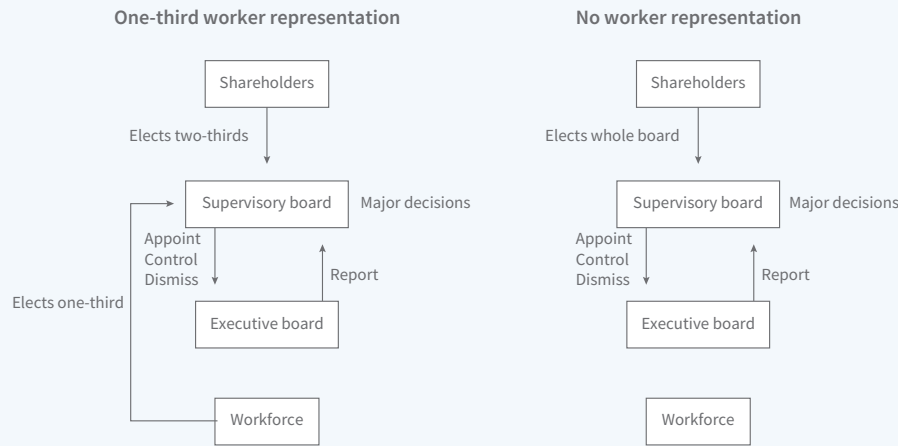
Does Board-Level Representation Raise Wages?

A fundamental question about codetermination is whether giving workers seats on corporate boards increases their bargaining power and, in turn, their wages—i.e., whether codetermination is essentially another version of local level unions and should be viewed through the lens of a US-style union model. An alternative view, advanced by the proponents of the shareholder values paradigm, is that board-level codetermination will ultimately lower wages through an exacerbation of hold-up and agency problems.²

In a study with Jörg Heining, we address this question using a natural experiment in Germany.³ In 1994, a reform of the Stock Corporation Act abolished the one-third board-level representation mandate for stock corporations incorporated after August 10, 1994. Crucially, the mandate was preserved—grandfathered—for corporations incorporated before that date. This created sharp, cohort-based variation in board composition among otherwise similar firms: corporations created just before the cutoff were required to have one-third worker representation on their supervisory boards, while their slightly younger peers created just after were not (unless they grew above the 500-employee threshold at which a size-based one-third mandate would kick in again). This variation motivated the first micro difference-in-differences design of this codetermination institution, for which causal inference in credible identification design has been elusive due to endogeneity concerns. Figure 1 depicts the two forms of corporate governance structures resulting from the German system.

We use administrative matched employer-employee data covering the

Corporate Governance and Worker Representation on Supervisory Board



Source: "Labor in the Boardroom," Jäger S, Schoefer B, Heining J. NBER Working Paper 26519, August 2020, and The Quarterly Journal of Economics 136(2), May 2021, pp. 669–725.

Figure 1

universe of German social security records, and our main outcome variable is worker-level outcomes. That is, we compare wages in firms incorporated just before (subject to codetermination) and after the August 1994 cutoff (no longer subject to it). As a second difference, we also draw on a control group of firms: limited liability companies, whose codetermination rules were unaffected by the reform.

The empirical evidence paints a relatively moderate picture of this facet of German codetermination: Board-level worker representation has no detectable effect on wages or the wage structure within the firm. Our point estimates are close to zero, and the confidence intervals allow us to rule out wage effects larger than about 4 percent. Both the point estimates around zero and the small positive confidence intervals are well below the cross-sectional union wage premium of 10 to 20 percent typically estimated in the United States. Moreover, we find no effects on within-firm wage inequality, no shift in the degree of rent sharing between firms and workers, and no change in the labor share of revenue. Figure 2 illustrates the wage effects for composition-adjusted wages.

We also find no evidence of the hold-up costs predicted by some economic theories: if workers use

their board positions to extract rents, firms might reduce investment in response. In fact, codetermined firms have, if anything, slightly higher capital intensity. This directly contradicts influential predictions that worker representation would lead firms to underinvest. The result is consistent with the institutional reality that worker representatives on German supervisory boards hold a minority of seats, do not directly set wages, and tend to exercise their role cooperatively rather than in an adversarial manner.

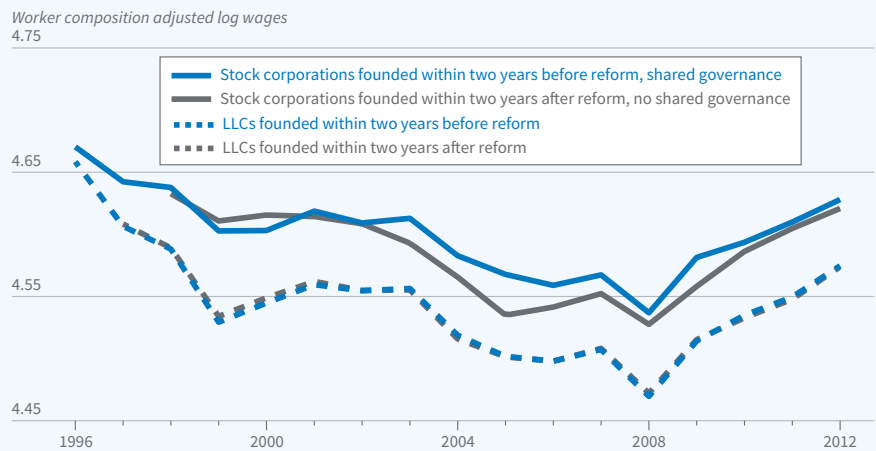
A Broader View of Codetermination's Effects

Our German findings are echoed by evidence from other settings. In a comprehensive assessment with Shakked Noy, we survey the available micro-level evidence on codetermination across multiple countries (and complement it with new macro-level analysis, summarized below).⁴ We hope that future research in other settings will continue to emerge, whether it evaluates historic or emerging reforms.

Reform-based quasi-experimental studies are difficult to implement as codetermination institutions are typically stable, with clean introductions or phase-outs being rare and rules in place before the advent of high-quality micro data. With Jarkko Harju, we studied the 1991 introduction of board-level codetermination in Finland.⁵ Here, the micro evidence points in the same direction: board-level worker representation has small, positive effects on wages. Figure 3 illustrates this effect. Effects on firm performance measures such as productivity, investment, and survival tend to be positive as well, with no evidence of adverse effects and more sizable, positive effects on labor productivity.

Reforms in Corporate Governance and Wages, Germany

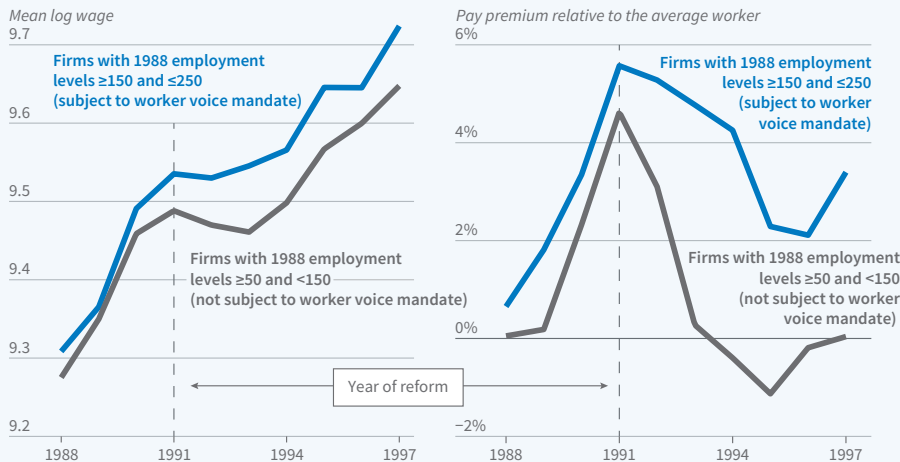
Figure 2



A German reform in 1994 mandated one-third of corporate board seats go to worker representatives. Source: "Labor in the Boardroom," Jäger S, Schoefer B, Heining J. NBER Working Paper 26519, August 2020, and The Quarterly Journal of Economics 136(2), May 2021, pp. 669–725.

Figure 3

Worker Representation and Wages in Finland



A 1991 Finnish reform introduced the right to worker representation on boards in firms with at least 150 employees. Source: "Voice at Work" Harju J, Jäger S, Schoefer B. NBER Working Paper 28522, May 2024.

Consistent with these findings, firms do not appear to bunch just below the employee thresholds at which codetermination mandates take effect, providing revealed-preference evidence that the institutions do not impose large costs on firms that those firms seek to avoid. This evidence echoes our results from Germany, where in the temporal dimension we found no evidence that stock corporations avoided codetermination by delaying incorporation.

These findings raise the broader question about which particular designs of codetermination may yield gains for workers or both sides, without employer opposition. In fact, in Finland, firms and workers negotiate the particular form of worker involvement, resulting in information sharing and softer worker voice, in contrast to the perhaps uniquely strong form that has emerged and remained persistent in the German context. These results suggest that the design of worker representation may matter considerably. Designs closer to pure voice—facilitating information exchange without reallocating formal decision-making power—appear to generate measurable productivity gains and employment stability, even when they do not substantially shift bargaining power over wages.

To assess whether these

micro-level findings hold in the aggregate, our work with Noy also implements country-level event studies around 10 major codetermination reforms across 14 European democracies from 1960 to 2019 using a synthetic control approach. We find no significant effects of codetermination reforms on wage growth, the labor share, total factor productivity growth, or GDP per capita growth. Figure 4 illustrates these findings for wages and the labor share.

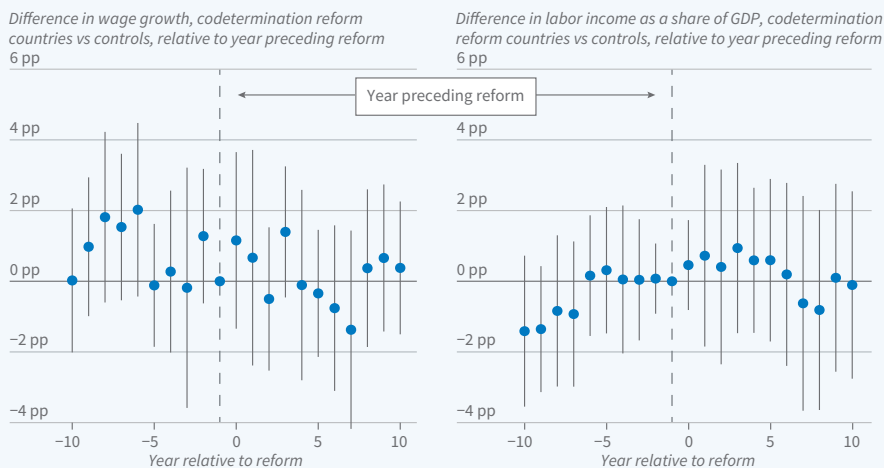
In these country-level panel regressions, confidence intervals widen

substantially. This limitation reflects the typical tension between credibly identified micro estimates and attempts to gain insights into the aggregate equilibrium effects of such institutions. Our hope is that the literature continues to make progress not just on the micro end of the spectrum.

We identify three explanations for codetermination's limited effects. First, existing laws impart relatively little formal authority to workers: Board-level representation is almost always a minority position, meaning shareholders can always outvote worker representatives. The specific strength and design of worker rights vary across countries, and we suspect that important insights can be gained by leveraging this qualitative variation of codetermination rules. Second, drawing on survey data, we find that many European workplaces already exhibit high levels of *informal* worker participation, so the marginal contribution of formal representation may be small. Third, where it exists, codetermination operates alongside complementary institutions—sectoral bargaining, strong labor regulations, and relatively cooperative labor-management norms—that may already manage the problems codetermination and worker representation would otherwise address. All these considerations require a nuanced approach to extrapolating context-specific

Figure 4

Labor Market Effects of European Codetermination Reforms



Thin bars represent 95% confidence intervals. Source: "What Does Codetermination Do?" Jäger S, Noy S, Schoefer B. NBER Working Paper 28921, October 2021, and IRL Review 75(4), December 2021, pp. 857–890.

estimates of causal effects, especially in environments such as the United States. However, recent work on the introduction of board-level representation in large French firms in 2015 finds similar results as those in the German and Finnish contexts, even though industrial relations in France are substantially more contentious and adversarial than in Germany or Finland.⁶

Collective Bargaining in International Perspective

The overall findings on codetermination raise the question of how related labor market institutions shape wages and inequality across countries and bring to the forefront their heterogeneous designs. In a recent study with Suresh Naidu, we turn our focus back to the institutions that have traditionally received more attention from labor economists: collective bargaining systems.

This study estimates the effect or workings of coverage and collective bargaining across 18 advanced economies using harmonized employer-employee data, a departure from the usual country-level approach in the literature.⁷ The institutional variation is enormous: collective bargaining coverage ranges from about 12 percent in the United States to near-universality in France, and bargaining structures differ dramatically in their centralization, coordination, and flexibility. As such, our study also provides a systematic description and comparison of the institutional features, be-

sides estimating country-level effects of coverage on wage structures.

The harmonized design permits us to reach new comparative econometric conclusions. For instance, a central empirical finding is that while there is a strong cross-country correlation between higher bargaining coverage and lower wage inequality, the direct micro-level effects of coverage on individual workers' wages are too small to fully account for this pattern.

Understanding the role of spillovers, equilibrium effects, and the broader institutional environment remains an important frontier for research—both for the traditional study of collective bargaining systems and for less studied labor market institutions such as codetermination.

¹ “The German Model of Industrial Relations: Balancing Flexibility and Collective Action,” Jäger S, Noy S, Schoefer B. NBER Working Paper 30377, August 2022, and *Journal of Economic Perspectives* 36(4), Fall 2022, pp. 53–80.

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² “Rights and Production Functions: An Application to Labor-Managed Firms and Codetermination,” Jensen MC, Meckling WH. *The Journal of Business* 52(4), October 1979, pp. 469–506. In 1979, Jensen and Meckling assessed the consequences of codetermination as follows: “[T]he workers will begin ‘eating it up’ [the firm] by transforming the assets of the firm into consumption or personal assets[...]. It will become difficult for

the firm to obtain capital in the private capital markets. [...] The result of this process will be a significant reduction in the country's capital stock, increased unemployment, reduced labor income, and an overall reduction in output and welfare.”

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³ “Labor in the Boardroom,” Jäger S, Schoefer B, Heining J. NBER Working Paper 26519, August 2020, and *The Quarterly Journal of Economics* 136(2), May 2021, pp. 669–725.

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⁴ “What Does Codetermination Do?” Jäger S, Noy S, Schoefer B. NBER Working Paper 28921, October 2021, and *IRL Review* 75(4), December 2021, pp. 857–890.

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⁵ “Voice at Work,” Harju J, Jäger S, Schoefer B. NBER Working Paper 28522, May 2024, and *American Economic Journal: Applied Economics* 17(3), July 2025, pp. 271–309.

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⁶ “A Seat at the Table: The Effects of Workers' Representation on Firm Performance and Jobs,” Mina A, Moschella D, Tiedtke J. SSRN, September 10, 2025.

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⁷ “Collective Bargaining, Unions, and the Wage Structure: An International Perspective,” Jäger S, Naidu S, Schoefer B. NBER Working Paper 33267, December 2024, and forthcoming in *Handbook of Labor Economics*.

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Simon Jäger

Simon Jäger is an associate professor of economics and public affairs, jointly appointed by Princeton University's Department of Economics and the School of Public and International Affairs, and a member of Princeton's Industrial Relations Section. He is a research associate in the NBER's Labor Studies program. Jäger's work focuses on labor markets and explores the origins and consequences of inequality. Before joining Princeton, Jäger worked as an associate professor at MIT. He holds a PhD in economics from Harvard University.

Benjamin Schoefer

Benjamin Schoefer is an associate professor in the Department of Economics at the University of California, Berkeley, and a research associate in the NBER's Economic Fluctuations and Growth, Labor Studies, Monetary Economics, and Public Economics programs. He serves as an associate editor at the *Journal of Monetary Economics* and as director of the Macro Labor Center for the Study on Aggregate Labor Markets, Policies, and Institutions at Berkeley and IRLE. Schoefer is also affiliated with CEPR, IZA, and CESifo. Schoefer received his PhD from Harvard University in 2015 and was awarded a Sloan Research Fellowship in 2021.

Eric Budish to Co-Direct Market Design Working Group



Research Associate **Eric Budish**, the Paul G. McDermott Professor of Economics and Entrepreneurship and Centel Foundation/Robert P. Reuss Faculty Scholar at the University of Chicago Booth School of Business, became co-director of the NBER's **Working Group on Market Design** at the start of 2026. He joins **Michael Ostrovsky** of Stanford Business School, one of the two current co-directors, and succeeds **Parag Pathak** of MIT, who along with **Susan Athey** launched the working group in 2008.

Budish, an NBER affiliate since 2015, is a research associate in the **Industrial Organization program**. He has studied many central topics in market design, including the design of financial exchanges, the operation of matching markets such as the course assignment markets used by universities, and the role of patents in influencing the allocation of R&D spending. He currently co-directs the Clark Center for Global Markets at Chicago Booth. Pathak, the Class of 1922 Professor of Economics at MIT, also contributed to many distinct questions in market design, including school choice and the allocation of students to schools in large urban school districts, the distribution of healthcare resources during pandemic-like events, and the design of lotteries for immigration visas. He directs Blueprint Labs at MIT.

Andrea Eisfeldt to Co-Direct Asset Pricing Program



Research Associate **Andrea Eisfeldt**, who holds the Laurence D. and Lori W. Fink Endowed Chair in Finance at the University of California, Los Angeles Anderson School of Management, has agreed to join Sydney Ludvigson as co-director of the NBER **Asset Pricing program**. Eisfeldt's research ranges widely and includes important contributions on market liquidity, the operation of over-the-counter markets, the role of intangibles in asset pricing, and the interplay between macroeconomics and finance. She is the vice president-elect of the Western Finance Association and vice president of the American Finance Association.

Besides Asset Pricing, Eisfeldt is also affiliated with the NBER's Corporate Finance and Economic Fluctuations and Growth programs. She succeeds Ralph Koijen of the University of Chicago Booth School of Business, who stepped down as Asset Pricing Program co-director in late 2025.

Kosali Simon to Direct Program on the Economics of Aging



Research Associate **Kosali Simon**, the Herman B. Wells Endowed Professor and Distinguished Professor at the Paul H. O'Neill School of Public and Environmental Affairs at Indiana University, will become director of the NBER **Program on the Economics of Aging** at the start of the 2026–27 academic year. She succeeds Jonathan Skinner of Dartmouth College, who has directed the program since 2016, when David Wise of the Harvard Kennedy School, the program's founding director, stepped down.

Simon, an NBER affiliate since 2002, has been an important contributor to the Economics of Aging program, serving on the program's steering committee and co-organizing Summer Institute meetings. Along with Katherine Baicker of the University of Chicago, she is the co-PI of a major **NIH grant that studies healthcare decision-making** and outcomes for patients with Alzheimer's disease.

Simon's research has advanced our understanding of how public and private health insurance affect healthcare outcomes, as well as how vaccines and other policy responses affected mortality during the COVID-19 pandemic. Besides the Economics of Aging, she is affiliated with the Children and Families and Economics of Health programs, and is president of the Association for Public Policy Analysis and Management.

New Initiative on Social Return to R&D Investment

Investments in research, development, and innovation are widely recognized as key drivers of long-term economic growth but estimates of the social rate of return on these investments vary substantially. To encourage research on this topic, sometimes called “The Griliches Question,” the NBER has launched a five-year project that will be organized around the creation of a **pop-up journal** devoted to this issue. The project will be led by

NBER affiliates **Craig Garthwaite** (Northwestern University) and **Timothy Simcoe** (Boston University). A steering committee of leading scholars and policy experts will help guide the project, which will host an annual research conference showcasing new findings on this topic. The project is supported by **Coefficient Giving** and the **Alfred P. Sloan Foundation**.

Conferences and Meetings

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

Title of Conference/Meeting	Organizers	Dates
Industrial Organization Program Meeting	José Ignacio Cuesta, Igal Hendel, and Nathan H. Miller	January 30–31
Economics of Crime Working Group Meeting	Jens Ludwig and Crystal Yang	February 6
Digital Economics and AI Tutorial	Martin Beraja, Avi Goldfarb, and Catherine Tucker	February 11–12
Digital Economics and AI Meeting	Chiara Farronato, Andrey Fradkin, Avi Goldfarb, and Catherine Tucker	February 12–13
Financial Market Frictions and Systemic Risks	Wenxin Du, Alp Simsek, Chester S. Spatt, and Mao Ye	February 19
Economics of Health Program Meeting	Christopher S. Carpenter, Yiqun Chen, Amy Finkelstein, Ethan M.J. Lieber, Matthew J. Notowidigdo, and Maggie Shi	February 19–20
Roundtable on the Applications of AI in Healthcare	Nikhil Agarwal and Kevin Schulman	February 20
Long-Term Fiscal Policy: The Economics of Debt and Deficits	Markus K. Brunnermeier and Ricardo Reis	February 26–27
Economic Fluctuations and Growth Program Meeting	Luigi Bocola and Linda Tesar	February 27
Microeconomic Policies and Economic Growth Pre-conference	Peter J. Klenow, Kenneth Kuttner, and Heidi L. Williams	March 5–6
Law and Economics Program Meeting	Christine Jolls	March 6
Monetary Economics Program Meeting	S. Borağan Aruoba and Daniel Greenwald	March 6
Immigrants and the US Economy	Aimee Chin and Kalena Cortes	March 6
CRIW Conference on Measurement of Housing and the Housing Sector	Thesia Garner, Joseph Gyourko, and Sonya Porter	March 12–13
Inflation: Frontiers of Research and Policy	Laurence M. Ball and Yuriy Gorodnichenko	March 12–13
Assessing the US Medical Innovation System	Stacie B. Dusetzina and Bhaven N. Sampat	March 13
Chinese Economy Working Group Meeting	Juan Carlos Suárez Serrato and Eric Zwick	March 19–20
Economics of Aging Program Meeting	Kathleen M. McGarry, Kosali I. Simon, and Jonathan S. Skinner	March 20
Economics of Race and Stratification	Francisca M. Antman, Robynn J.A. Cox, Bocar A. Ba, and Trevon D. Logan	March 27
International Finance and Macroeconomics Program Meeting	Nitya Pandalai-Nayar and Diego J. Perez	March 27
Gender in the Economy: Structural Transformation and Women’s Time Use	Claudia Olivetti, Taryn Dinkelman, and Claudia Goldin	March 27
Development of the American Economy	Leah Platt Boustan and William J. Collins	March 28

Awards to NBER Affiliates, 2025

[Atila Abdulkadiroglu](#), [Eric Budish](#), [Cécile Gaubert](#), [Bryan S. Graham](#), [Nathaniel Hendren](#), [Anil K. Kashyap](#), [Edward Miguel](#), [David Romer](#), and [Francesco Trebbi](#) were elected fellows of the Econometric Society.

[Ran Abramitzky](#) received an honorary doctorate from the University of Southern Denmark.

[Nikhil Agarwal](#) received the 2025 Infosys Science Foundation Prize.

[Lee J. Alston](#) received the 2025 Jonathan Hughes Prize for Excellence in Teaching Economic History from the Economic History Association.

[Marcella Alsan](#) was named to the 2025 STATUS List by STAT and received the Excellence in Research & Innovation Award from the Loyola University Stritch School of Medicine.

[Marcella Alsan](#) and [Heidi Williams](#), along with [Maya Durvasula](#), [Harsh Gupta](#), [Josh Schwartzstein](#), received the 33rd Arrow Award for the best paper in health economics from the International Health Economics Association.

[Marcella Alsan](#) and [Crystal Yang](#) received the B. Jaye Anno Award of Excellence in Communication on Correctional Health Care from the National Commission on Correctional Health Care.

[David Autor](#), [Marianne Bertrand](#), [Nicholas A. Bloom](#), [Lawrence F. Katz](#), and [Sendhil Mullainathan](#) each received the Clarivate Citation Award.

[Adrien Auclert](#) received the inaugural Janet Yellen Award for Monetary Research from the Federal Reserve Bank of San Francisco.

[Katherine Baicker](#) received the William B. Graham Prize for Health Services Research from the Association of University Programs in Health Administration.

[H. Spencer Banzhaf](#) and [Randall Walsh](#) received the Publication of Enduring Quality Award from the Association of Environmental and Resource Economists for their 2008 *American Economic Review* paper "Do People Vote with their Feet?"

[Anirban Basu](#) received the Health Economics and Outcomes Research Excellence - Application Award from the International Society for Pharmacoeconomics and Outcomes

Research.

[Olivier Blanchard](#), [Jordi Galí](#), and [Michael Woodford](#) received the 17th Frontiers of Knowledge Award: Economics, Finance and Business Management from the BBVA Foundation.

[Corina Boar](#), [Lian Chen](#), [Matthew Rognlie](#), [Yotam Shem-Tov](#), [Maria Micaela Sviatschi](#), [Emil Verner](#), and [Christian K. Wolf](#) received Sloan Research Fellowships.

[Axel H. Börsch-Supan](#) received an honorary doctorate in health sciences from the University of Eastern Finland.

[Giulia Brancaccio](#) received the Carlo Alberto Medal from Collegio Carlo Alberto for exceptional research in the field of economics.

[Zach Brown](#) and [Alexander MacKay](#) received an *American Economic Journal: Microeconomics* Best Paper Award for "Competition in Pricing Algorithms."

[Markus Brunnermeier](#), [Kristian Blickle](#), and [Stephan Luck](#) received the Michael J. Brennan Best Paper Award from the Society for Financial Studies for "Who Can Tell Which Banks will Fail?"

[Eric Budish](#), [Andrew Lewis-Pye](#), and [Tim Roughgarden](#) received a Best Theoretical Research Paper Award from the ACM CCS Workshop on Decentralized Finance and Security for "The Economic Limits of Permissionless Consensus."

[Christopher Carpenter](#), [Donn Feir](#), [Casey Warman](#), and [Krishna Pendakur](#) received the AEA CSQIEP Award for Outstanding Research Paper in LGBTQ+ Economics for their *AER: Insights* paper, "Nonbinary and Transgender Identities and Earnings: Evidence from a National Census."

[Anne Case](#) and [Angus Deaton](#) received the Paul A. Volcker Lifetime Achievement Award for Economic Policy from the National Association for Business Economics.

[Taha Choukmane](#), [Cormac O'Dea](#), and [Lucas Goodman](#) received the 2025 TIAA Paul A. Samuelson Award for outstanding scholarly writing on lifelong financial security for their paper "Efficiency in Household Decision-Making: Evidence from

Retirement Saving of US Couples."

[Lauren Cohen](#), [David Kim](#), and [Eric So](#) received a Best Paper Award from the Eastern Finance Association meetings. [Cohen](#), with [Umit Gurun](#) and [N. Bugra Ozel](#), also received the 28th Annual Glen McLaughlin Prize for Research in Accounting Ethics from the University of Oklahoma.

[Janet Currie](#) was named a research fellow of the ROCKWOOL Foundation Berlin Institute for the Economy and the Future of Work.

[Janet Currie](#), [Barbara M. Fraumeni](#), [Joseph P. Newhouse](#), and [Timothy Taylor](#) were named Distinguished Fellows of the American Economic Association.

[Sabrina Di Addario](#), [Patrick Kline](#), [Raffaele Saggio](#), and [Mikkel Sølvsten](#) received the Aigner Award from the *Journal of Econometrics* for their paper "It ain't where you're from, it's where you're at: Hiring origins, firm heterogeneity, and wages."

[Pascaline Dupas](#) was named to Vox's "Future Perfect 25" list for "advancing solutions for the most pressing challenges in global health and development."

[Gilles Duranton](#) and [Diego Puga](#) received the Maurice Allais Economics Prize for their paper "Urban Growth and Its Aggregate Implications."

[Janice Eberly](#) was elected president of the American Economic Association.

[Andrea L. Eisfeldt](#) was elected vice president-elect of the Western Finance Association and vice president of the American Finance Association.

[Alex Eble](#) received the Khalifa International Award for Early Learning in the Best Research and Studies category.

[Joshua Gans](#) was named a fellow of the Royal Society of Canada.

[Donna K. Ginther](#), [John C. Haltiwanger](#), [James D. Hamilton](#), [Sergio Rebelo](#), and [Catherine Wolfram](#) were inducted into the American Academy of Arts and Sciences.

[Donna K. Ginther](#) received the Carolyn Shaw Bell Award from the Committee on the Status of Women

in the Economics Profession of the American Economic Association. She also received a Big 12 Faculty of the Year Award from the Big 12 Conference.

[Edward Glaeser](#) received the John Quigley Medal from the American Real Estate and Urban Economics Association and was elected to the National Academy of Sciences.

[Claudia Goldin](#) received a Gold Medal Honor from the National Institute of Social Sciences, was elected an International Fellow of the British Academy, received the 2025 Woman of the Year Award from WE CAN, and received honorary doctorates from Columbia University and the Jewish Theological Seminary.

[Pinelopi K. Goldberg](#) was elected an International Fellow of the British Academy, received the Jean-Jacques Laffont Prize, and was honored with the A.SK Award from the WZB Berlin Social Science Center.

[Robert J. Gordon](#) received an honorary doctorate from Sorbonne University.

[Niels Joachim Gormsen](#), [Kilian Huber](#), and [Sangmin S. Oh](#) received the FESE De La Vega Prize.

[Joshua Gottlieb](#) received the ASHEcon Medal from the American Society of Health Economists.

[Wayne Gray](#) and [Rabia Manzoor](#) received the Michael Szenberg Prize for the best article published in *The American Economist* for “Decomposition Analysis of Racial Income Inequality in the United States.”

[Shane Greenstein](#) received the Distinguished Service Award from the Industrial Organization Society.

[Atul Gupta](#), [Elena Andreyeva](#), [Catherine Ishitani](#), [Malgorzata Sylwestrzak](#), and [Benjamin Ukert](#) received the 31st Annual National Institute for Healthcare Management Policy Research Award for their paper “The Corporatization of Independent Hospitals.”

[Bronwyn H. Hall](#) received the Extraordinary Achievement Award from the annual Patent Conference at the University of San Diego School of Law.

[Oliver Hart](#) received honorary doctorates from the University of Cambridge and Paris-Panthéon-Assas University.

[Alex Hollingsworth](#), [Krzysztof Karbownik](#), [Melissa Thomasson](#), and [Anthony Wray](#) received a Quality of Research Discovery Award from the Agricultural & Applied Economics Association for their *American Economic Review* paper “The Gift of a Lifetime: The Hospital, Modern Medicine, and Mortality.”

[Harrison Hong](#) received a Guggenheim Fellowship for research on adaptation to a changing climate.

[Peter Howitt](#), NBER director [Joel Mokyr](#), and [Philippe Aghion](#) shared the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel.

[Anton Korinek](#) was named to the TIME100 AI list.

[Darius Lakdawalla](#) was elected a member of the National Academy of Medicine.

[Brigitte C. Madrian](#) received the International Educator of the Year Award from the Academy of International Business.

[Nadya Malenko](#), [Edwin Hu](#), and [Jonathon Zytnick](#) received a John L. Weinberg/IRRCi Research Paper Award, a Paul Van Arsdell Award in Corporate Finance from the Midwest Finance Association, and the Best Paper Award at The First Annual Corporate Governance Academic Forum at the University of Toronto for the paper “Custom Proxy Voting Advice.”

[Nadya Malenko](#), [Robin Döttling](#), [Doron Levit](#), and [Magdalena Rola-Janicka](#) received a John L. Weinberg/IRRCi Research Paper Award for “Voting on Public Goods: Citizens vs Shareholders.”

[Sara Markowitz](#) was elected president of the Southern Economic Association.

[Olivia S. Mitchell](#) was named a Distinguished Fellow of the School of Business Administration at the Hebrew University of Jerusalem.

[Jacob Moscona](#) received an Excellence Award in Global Economic Affairs from the Kiel Institute for the World Economy.

[John Mullahy](#) and [Edward Norton](#) received the Willard G. Manning Memorial Award for the Best Research in Health Econometrics from the American Society of Health Economists for their paper “Why Transform Y? The Pitfalls of

Transformed Regressions with a Mass at Zero.”

[Maurice Obstfeld](#) was elected president of the Western Economic Association International.

[Bruno Pellegrino](#), [Enrico Spolaore](#), and [Romain Wacziarg](#) received the Federico Prades Award for Young Economists from the Spanish Banking Association for their paper “Barriers to Global Capital Allocation.”

[Dani Rodrik](#) received honorary doctorates from the National Autonomous University of Mexico and from Poznań University of Economics and Business.

[Juliana Salomao](#), [Frederico Belo](#), and [Yao Deng](#) were runners-up for the Fama-DFA Prize for the best capital markets and asset pricing papers in the *Journal of Financial Economics*.

[José A. Scheinkman](#) received the University of Rochester Distinguished Scholar Award.

[Elizabeth Setren](#) received a Presidential Early Career Award for Scientists and Engineers from the US Department of Education.

[Dan Sichel](#) received the Julius Shiskin Memorial Award for Economic Statistics.

[César Sosa-Padilla](#) and [Javier Bianchi](#) received the Premio ANCE Victor Elías from the National Academy of Economic Sciences (Argentina) for their *Review of Economic Studies* paper “Reserve Accumulation, Macroeconomic Stabilization, and Sovereign Risk.”

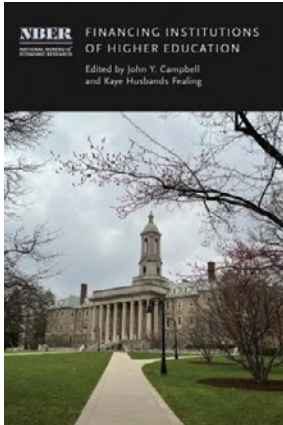
[Stefanie Stantcheva](#) received the John Bates Clark Medal from the American Economic Association.

[Daniel Trefler](#) was elected a fellow of the Royal Society of Canada and of the Canadian Economics Association.

[Stijn Van Nieuwerburgh](#), [Sven Damen](#), and [Matthijs Korevaar](#) received best paper prizes at the American Real Estate and Urban Economics Association National Conference and at the European Real Estate Society meeting for “An Alpha in Affordable Housing?”

[Annette Vissing-Jorgensen](#) received an honorary doctorate from Aarhus University.

Books



Financing Institutions of Higher Education

John Y. Campbell and **Kaye Husbands Fealing**, editors

The US higher education sector faces numerous economic challenges, including the stagnating number of college-age domestic students, geographic mismatch between population growth and the location of colleges and universities, financial pressures including cutbacks in government support, growing student debt burdens, sticker prices that deter prospective applicants, and the risk of low capital market returns on endowment portfolios.

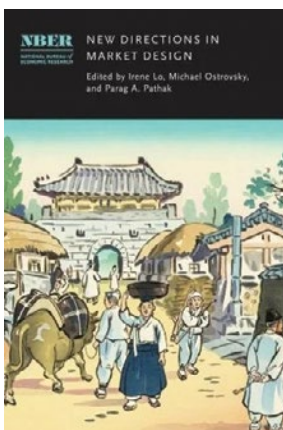
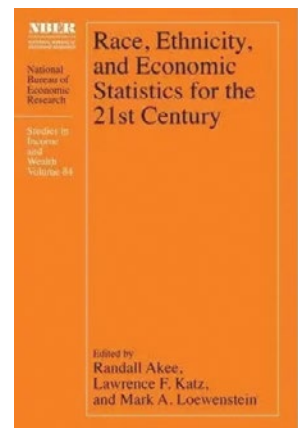
This **volume** analyzes the responses of students, families, and the financial managers of higher education institutions to these challenges. It presents new insights on the substantial disparities in the financial structure of, and the financial challenges facing, different types of institutions. The volume draws together contributions from financial economics, public finance, and industrial organization, as well as the economics of education.

Race, Ethnicity, and Economic Statistics for the 21st Century

Randall Akee, **Lawrence F. Katz**, and **Mark Loewenstein**, editors

The increasing racial and ethnic diversity of the US population raises the question of whether the race and ethnicity categories and definitions used by federal statistical agencies to create demographic statistics on which government officials, business decision-makers, and private citizens fully reflect the changing population. Official definitions of existing race and ethnic groups do not always command wide agreement, and over time, some definitions that were once widely accepted may become less so based on political, legal, and social factors. Comparable measures of race and ethnicity over time are needed to accurately track historical changes in economic and social outcomes, as well as racial and ethnic segregation.

This **volume** explores the production of economic statistics that accurately depict the complex racial and ethnic diversity of the US population in the twenty-first century. The chapters examine the consequences for economic analyses of different measurement choices concerning race and ethnicity, assess the likely implications of the 2024 changes in federal race and ethnicity measurement standards, introduce new datasets with richer demographic information, and compare measures of race and ethnicity in administrative versus survey data. They also apply existing data in creative ways to develop alternative characterizations of the changing US workforce and to illuminate important policy questions related to criminal justice, immigration, labor market discrimination, the social safety net, healthcare, and child welfare.



New Directions in Market Design

Irene Yuan Lo, **Michael Ostrovsky**, and **Parag Pathak**, editors

In the mid-1990s, the first Federal Communications Commission spectrum auction and the redesign of the National Residency Matching Program collectively helped to jump-start the field of market design. Since then, extensive research has improved auction design and broken new conceptual ground in addressing multi-agent matching problems.

This **volume** summarizes key discoveries and advances in market design over the past three decades and explores contemporary challenges—from climate policy and electricity markets to AI-mediated exchanges and hospital resource allocation. Contributors examine how to design efficient, incentive-compatible mechanisms that are robust to shifting conditions and increasing complexity.

They consider a wide variety of applications that could benefit from the market design viewpoint, such as environmental markets, school choice, and organ exchange. The chapters illustrate the important interactions between economic theory, computational tools, and institutional insight.



Environmental and Energy Policy and the Economy, volume 7

Matthew J. Kotchen, Tatyana Deryugina, and Catherine D. Wolfram, editors

This volume presents six new papers on environmental and energy economics and policy.

Judson Boomhower and Meredith Fowlie illustrate the distributional consequences of improving risk pricing efficiency in wildfire insurance markets.

Claire Brunel and Arik Levinson develop a conceptual framework for understanding the economic and environmental consequences of taxes on imports of goods based on their carbon content.

Karen Clay, Danae Hernandez-Cortes, Akshaya Jha, Joshua Lewis, Noah Miller, and Edson Severnini study the long-run distributional implications of US power plant sitings over more than a century.

Todd Gerarden, Mar Reguant, and Daniel Xu provide a comprehensive overview of industrial policy in the renewable energy sector, with comparisons across the US, EU, and China.

Jamie Hansen-Lewis and Michelle Marcus show how failure to account for behavioral responses can affect policy predictions regarding maritime emissions.

Finally, Richard Sweeney and Joseph Wilske estimate the externalities associated with correlated intermittency in electricity generation from US wind power investments.

Entrepreneurship and Innovation Policy and the Economy, volume 5

Benjamin Jones and Josh Lerner, editors

This volume of the Entrepreneurship and Innovation Policy and the Economy series brings rigorous new economic research to bear on a number of current policy issues.

Andrew Fieldhouse and Karel Mertens quantify the social returns to public R&D and find that federal investments have yielded extraordinarily high productivity payoffs. They argue that cuts to non-defense R&D risk long-run damage to economic growth.

Douglas Elmendorf, R. Glenn Hubbard, and Zachary Liscow examine the interaction of innovation-friendly growth-oriented policies with deficit reduction and conclude that while such policies alone cannot stabilize federal debt, they can meaningfully ease fiscal pressures.

Timothy Simcoe and Nirupama Rao document the effectiveness of R&D tax credits while highlighting design challenges such as the need to ensure that credits stimulate additional research rather than subsidize activity that firms would have undertaken in their absence.

Kyle Myers, Lauren Lanahan, and Evan Johnson analyze the Small Business Innovation Research (SBIR) program and show that small firms supported through SBIR pursue distinctive strategies compared to venture-backed startups.

Pierre Azoulay, Daniel Gross, and Bhaven Sampat analyze indirect cost recovery, the system by which research universities are reimbursed for overhead.

Fiona Paine, Richard Townsend, and Ting Xu assess restrictions on foreign investment in startups, weighing national security concerns against the costs to innovation ecosystems.

Aaron Chatterji and Fiona Murray argue that geopolitics is fundamentally reshaping the economics of innovation, and distill the implications of this development for the approaches that are used in studying innovation policy.



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