

The Digest

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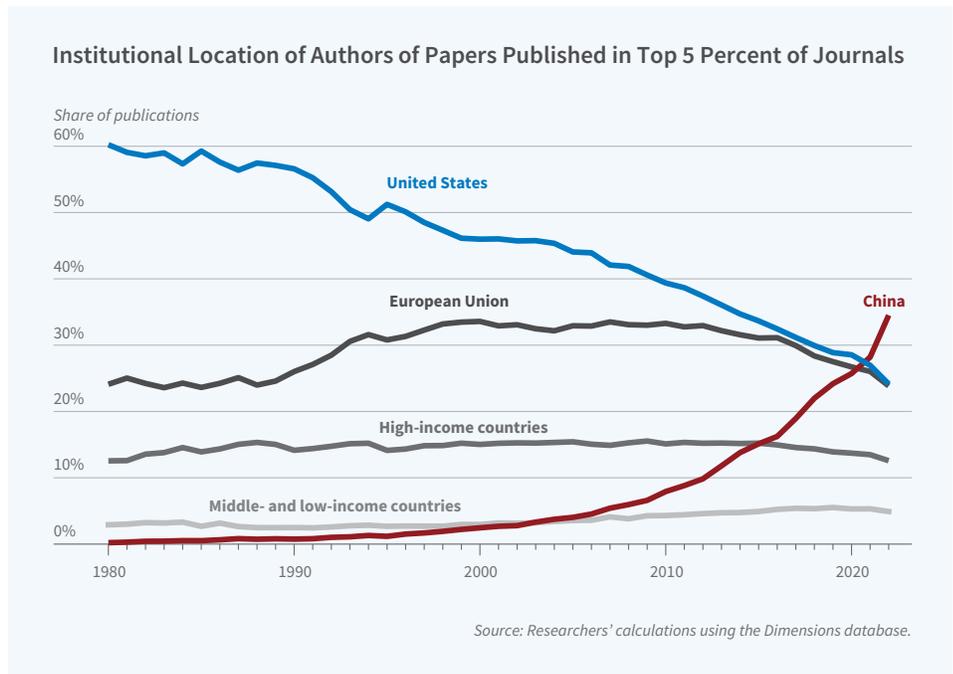
China's Rise in Global Research

Although Western nations have dominated global scientific research since the nineteenth century, recent decades have witnessed profound shifts in where research is conducted, what topics it addresses, and how widely its findings spread across borders. In *The Geography of Science* (NBER Working Paper 34694), [Abhishek Nagaraj](#) and [Randol Yao](#) provide a comprehensive analysis of the evolution of global science between 1980 and 2022. Using data on 44 million publications from nearly 12,000 journals, they track where science is produced, based on author affiliations, what science studies, based on geographic references in titles and abstracts, and where science is consumed, based on citation patterns.

The researchers geocoded institutional affiliations for over 147 million publication-researcher pairs and identified the geographic focus for approximately 7 million publications in 22 fields of study. They categorized research into five regions: the United States, high-income European Union countries, other high-income countries, China, and other middle- and low-income countries.

The US share of global publications declined from 40 percent in 1980 to 15 percent in 2022, while China's share rose from near zero to 32 percent. In 2022, China produced over 35 percent of the publications in top-tier journals, more than either the US or the EU. Other middle- and low-income countries collectively account for 21 percent of global publications, comparable to high-income EU countries combined.

The shift over the last four decades reflects both expanded researcher numbers in China and increased researcher productivity. Chinese researchers represent 18 percent of all researchers in the sample and 26 percent of researchers in top journals in 2022. Excluding cross-regional collaborations produces similar trends, indicating the patterns are not primarily driven by international co-authorship.



Between 1980 and 2022, China's share of global research publications rose from a negligible level to 32 percent, while the US share declined from 40 to 15 percent.

China leads in engineering and physical sciences, particularly chemistry, producing over 60 percent of breakthrough publications in materials engineering, communications engineering, and physical chemistry. The US maintains dominance in biomedical and health sciences, including reproductive medicine and biochemistry. Middle- and low-income countries lead in agriculture, veterinary, and food sciences but remain underrepresented in top-tier journals across most fields.

Among breakthrough publications, over 40 percent focus on US topics, while only 13 percent address topics regarding middle- and low-income countries. However, in lower-tier venues, research attention to these nations has increased,

reaching 35 percent of geographically focused publications by 2022, with China accounting for over 20 percent.

Citation analysis reveals fragmentation in knowledge diffusion. Chinese research exhibits the highest concentration of citations within its own borders. Between 58 and 68 percent of citations to Chinese publications come from other Chinese publications, even for breakthrough work. This contrasts sharply with other regions, where cross-border citation rates are substantially higher. Citation concentration across regions declined between 1980 and 2020 for all publication types, indicating increasing globalization, but Chinese publications consistently showed the slowest move toward global diffusion.

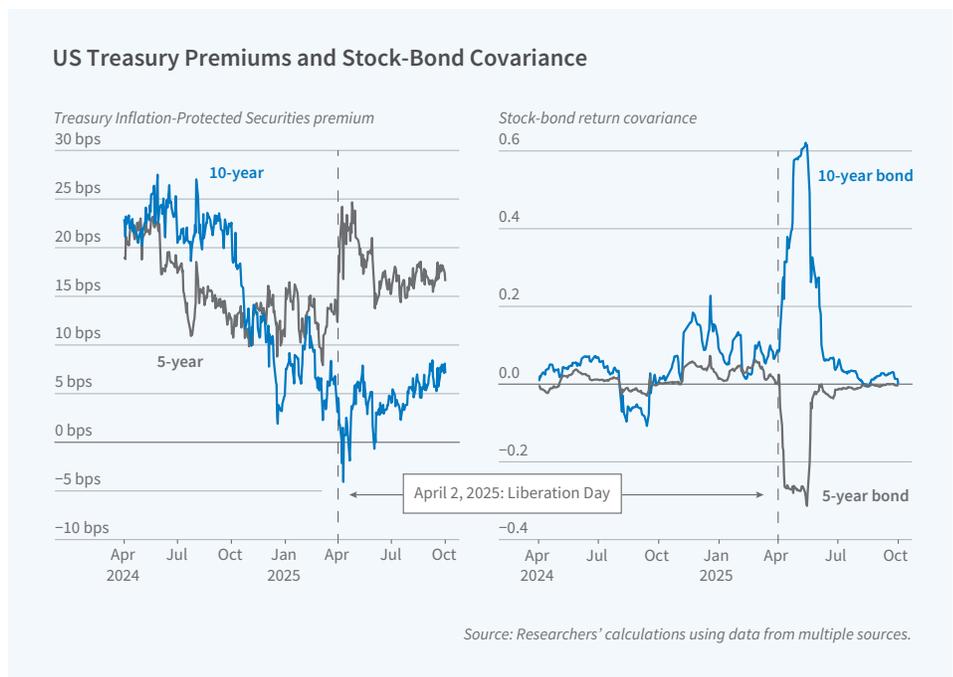
US Treasury Bonds and Trade Policy Uncertainty

In April 2025, the United States implemented its highest tariffs in a century, triggering reciprocal tariff announcements from China, Canada, and the European Union. In the days following the tariff announcements, the S&P 500 fell more than 11 percent. The yield on 30-year Treasury bonds rose and peaked at 5.2 percent in late May, its highest level since before the 2007–08 global financial crisis.

In [Tariff War Shock and the Convenience Yield of US Treasuries—A Hedging Perspective](#) (NBER Working Paper 34640), [Viral V. Acharya](#) and [Toomas Laarits](#) investigate the breakdown in long-term Treasury bonds' traditional role as a hedge against stock market declines. The researchers decompose Treasury yields into three components: a risk-free rate, a credit spread, and a convenience yield. They measure convenience yield using the Treasury Inflation-Protected Securities (TIPS)-Treasury premium, which compares nominal Treasury yields with synthetic nominal Treasuries constructed from TIPS and inflation swaps. The convenience yield—the premium investors pay for Treasury securities' liquidity, safety, and collateral value—typically ranges between 10 and 40 basis points for long-term bonds. Using intraday data at five-minute intervals from two actively traded exchange-traded funds (ETFs)—SPY, an S&P 500 fund, and IEF, a fund of 7–10 year maturity nominal Treasuries—they calculate daily stock-bond covariances to capture rapid shifts in market dynamics.

The 10-year TIPS-Treasury premium declined by nearly 10 basis points from late March 2025 to its trough on April 10, a significant drop relative to the average historical spread of 24 basis points. The two-year premium exceeded the 10-year premium by 7 basis points in April 2025, reversing the typical relationship where these measures were historically an average of only 2 basis points apart.

On April 9, April 11, and April 23, three days coinciding with major tariff announcements, the returns on long-term Treasuries exhibited positive



covariance with stocks, meaning they declined alongside equities rather than serving as a hedge. The April 23 positive covariance ranked in the top 0.25 percent of all trading days since 2005. Decomposing bond returns by yield component shows that the positive covariance arose specifically from day-to-day changes in convenience yield at the 10-year maturity, while the two- and five-year convenience yields maintained their traditional negative covariance with stocks.

Using historical data spanning two decades, the researchers estimate that the shift in hedging properties can account for approximately 12 basis points of the convenience yield decline, a magnitude that is consistent with the observed drop. Throughout the period following the tariff announcement, the short end of the Treasury curve continued exhibiting safe-asset properties, with two- and five-year convenience yields increasing over 10 basis points relative to their pre-announcement levels.

The researchers consider two potential explanations for the shift in the hedging properties of long-term Treasuries. One is changing demand for long-term Treasuries as a safe long-term asset. Treasury International Capital System data show \$47 billion

in outflows from long-term US Treasuries in April 2025, a 2 standard deviation shift from the typical \$47 billion monthly inflow since February 2023. The euro area, Canada, and Asian countries all sold Treasuries opposite their historical pattern during market stress. Meanwhile, gold appears to have emerged as an alternative safe asset. Intraday analysis shows a negative relationship between stock-bond and stock-gold covariances. On days when Treasuries exhibited positive covariance with stocks, gold showed negative covariance, suggesting investors substituted gold for long-term Treasuries as a hedge.

A second potential explanation is rising inflation expectations. Higher expected inflation can reduce long-term convenience yields more than short-term convenience yields. However, inflation expectations rose only modestly in April 2025: 36 basis points for the two-year, 13 basis points for the five-year, and just 5 basis points for the 10-year convenience yields. These increases are insufficient to explain the 15 basis point divergence between short-term and long-term convenience yields. It appears, therefore, that the observed changes reflected concerns about Treasury hedging properties rather than inflation expectations.

The Health and Healthcare Spending Effects of GLP-1s

Glucagon-like peptide-1 receptor agonists (GLP-1s), better known by brand names such as Ozempic and Wegovy, have generated intense interest as potentially transformative treatments for type 2 diabetes and obesity. Clinical trials found substantial weight loss and improved cardiovascular outcomes associated with taking these medications. Two new studies estimate how these drugs affect health outcomes and medical care costs in the broad population.

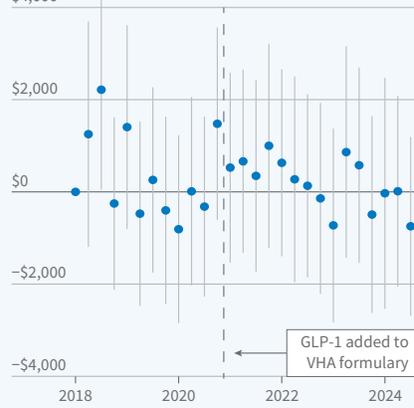
In [Weighing the Impacts of GLP-1s: Quasi-Experimental Evidence from Provider Adoption](#) (NBER Working Paper 34667), [Sam Bock](#), [Jasmin Moshfegh](#), and [Jonathan Zhang](#) study 1.4 million veterans who were diagnosed with diabetes or obesity and who received care through the Veterans Health Administration (VHA). The researchers exploit variation in prescribing patterns among VHA primary care providers following the addition of GLP-1s to the VHA formulary in November 2020. They measure each patient's existing 2018 primary-care provider's propensity to adopt GLP-1s by calculating that provider's likelihood of prescribing GLP-1s in the 2021–22 period. Then, they compare outcomes between patients with 2018 providers who were high- and low-adopting practitioners. Patients whose providers became “always-adopters,” prescribing GLP-1s frequently, were 20 percentage points more likely to fill GLP-1 prescriptions in 2023–24 than those with providers who never prescribed GLP-1s.

The estimated effects on blood glucose and body weight were largest in 2021, immediately after GLP-1s were included in the VHA formulary. A 30-week dose of GLP-1 results in a 3.3 percent loss of weight and a drop in blood glucose A1C of 0.32 percentage points, changes that closely match clinical trial results. Over time, however, the treatment effect of a marginal 30-week regimen dissipated. By 2024, the associated weight loss was only half as large as the 2021 estimate, and the effect on A1C was not statistically different from zero. This attenuation is explained in part by shifting complier composition: As GLP-1 diffusion expands, the marginal patients induced into treatment become progressively healthier.

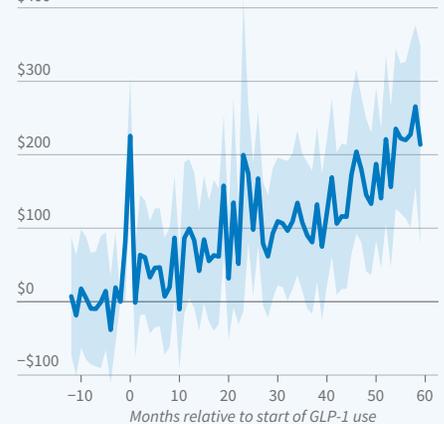
Despite the metabolic improvements, the study finds no evidence of broader health improvements or utilization changes

GLP-1 Use and Medical Spending

Change in quarterly total medical spending (2025 dollars) by diabetic or obese veterans, relative to 2018q1



Change in monthly non-GLP-1 medical spending for patients starting GLP-1 use, relative to 2 months before start



Thin bars and shaded area correspond to 95% confidence intervals. Sources: Data from Veterans Health Administration (left panel) and the Merative MarketScan Commercial database (right panel).

in data up to and including 2024. Although the researchers replicate a clinical trial finding of a reduction in heart attacks and strokes among patients with existing cardiovascular disease and chronic kidney disease and a reduction in moderate alcohol consumption risk, they find no statistically significant decline in broader emergency department visits or in any major diagnostic category. Mental health measured via clinical questionnaires is also unchanged. Notably, the researchers do not observe changes in total non-medication, non-GLP-1 medical spending.

In a second study, [Do GLP-1 Medications Pay for Themselves?](#) (NBER Working Paper 34678), [Coady Wing](#), [Sih-Ting Cai](#), [Daniel W. Sacks](#), and [Kosali I. Simon](#) analyze commercial insurance claims for approximately 537,000 patients who initiated GLP-1 treatment between 2017 and 2022. They compare patients initiating treatment in a given month to those who initiate 12 months later in a one-year follow-up design and 60 months later in a five-year follow-up design, allowing them to control for underlying time trends and baseline health differences. They find that patients spend approximately \$1,000 on GLP-1s in their initiation month, but many discontinue treatment within the first few months. The share with active supply stabilizes at about 60 percent after three months and 56 percent after one year.

Accounting for discontinuation, cumulative GLP-1 spending is about \$6,500 in the first year and \$22,500 over five years.

The researchers find no reduction in overall healthcare spending following GLP-1 initiation. In fact, in the first year after initiation, total non-GLP-1 spending increases by \$585. The spending increase is driven primarily by higher outpatient costs, an increase of \$438 in the first year, likely reflecting monitoring visits for dose titration and managing side effects. While GLP-1 initiation reduces spending on other diabetes medications by \$189 annually, this offset is insufficient to counterbalance increased outpatient costs. Over five years, non-GLP-1 spending increases by \$6,800, or 30 percent of the amount spent on GLP-1s. The pattern persists across patient subgroups, including those with diabetes, cardiovascular disease, and obesity diagnoses.

The researchers conjecture that the difference between the findings for broader health improvements in GLP-1 clinical trials and in the rollout of these drugs in the general population may result from greater adherence to the GLP-1 regimen for those in clinical trials and from differences in the treatment populations. Relative to participants in clinical trials, patients receiving GLP-1s in the general population are probably healthier, with less scope for short-run health improvements and cost savings.

The authors of “Weighing the Impacts of GLP-1s: Quasi-Experimental Evidence from Provider Adoption” acknowledge support from the Department of Veterans Affairs Office of Academic Affiliations Advanced Fellowships, and Jasmin Moshfegh acknowledges support from The Big Data Scientist Training Enhancement Program.

The authors of “Do GLP-1 Medications Pay for Themselves?” acknowledge support from Indiana University’s Health Excellence Achieved through Learning Health Systems Research (HEALeR) Collaborative, and the National Institute for Healthcare Management Foundation.

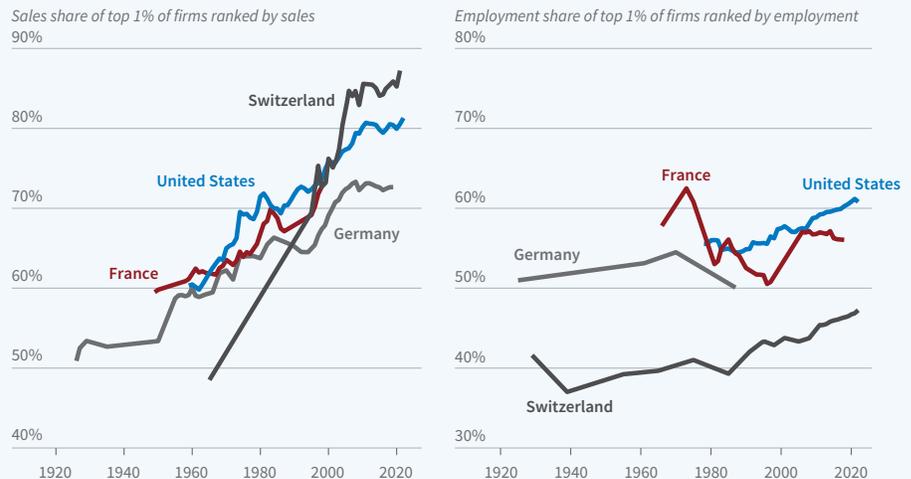
Long Run Evolution of the Size Distribution of Businesses

In [Business Concentration Around the World: 1900–2020](#) (NBER Working Paper 34711), [Yueran Ma](#), [Mengdi Zhang](#), and [Kaspar Zimmermann](#) analyze data on firm size distributions in 10 advanced market economies in Asia, Europe, North America, and Oceania. They find that sales, net income, and equity capital have become increasingly concentrated in the largest firms. The top 1 percent of firms by sales now account for around 80 percent of economy-wide sales in many countries, up from around 50 percent in the early twentieth century. Employment concentration has nevertheless remained relatively stable, with the largest 1 percent of firms by number of employees accounting for roughly half of economy-wide employment throughout this period.

The sales share of the top 1 percent of firms rose from around 50 percent in the 1950s and 1960s to between 70 and 80 percent by the 2010s in most countries with available data. The net income share of the top 1 percent in Australia and Canada increased from between 40 and 50 percent in the 1940s to around 60 percent by the 1970s and 1980s and 80 percent by 2000 in Australia (Canadian data end in 1987). For equity capital in Germany, Denmark, and Switzerland, the top 1 percent share grew from around 40 percent in the early 1900s to 60 percent or more by the 1980s. The trends of rising business concentration hold at the industry as well as the national level.

In contrast, employment concentration remained largely stable over

Concentration of Sales and Employment in Top 1% of Firms



The concentration of sales, income, and capital among the largest firms has risen worldwide, while the concentration of employment has been stable.

the period of study. The top 1 percent of firms by employment accounted for roughly 50 percent of economy-wide employment throughout the twentieth century in most countries in the sample. In manufacturing, employment concentration showed little long-run change. However, in retail and wholesale trade, employment concentration increased substantially, with magnitudes comparable to the rise in sales concentration.

Standard production functions with complementarity between capital and labor would predict the concentration of sales, capital, and employment

to move together. The researchers suggest that automation—with large firms increasingly substituting capital for labor—may explain the divergence of employment concentration, particularly in manufacturing where capital-to-labor ratios have increased substantially more than in retail and wholesale trade. The pervasiveness of rising concentration across diverse countries and time periods suggests broad-based economic forces rather than country-specific policies or demographics are important for understanding these fundamental shifts in production organization.

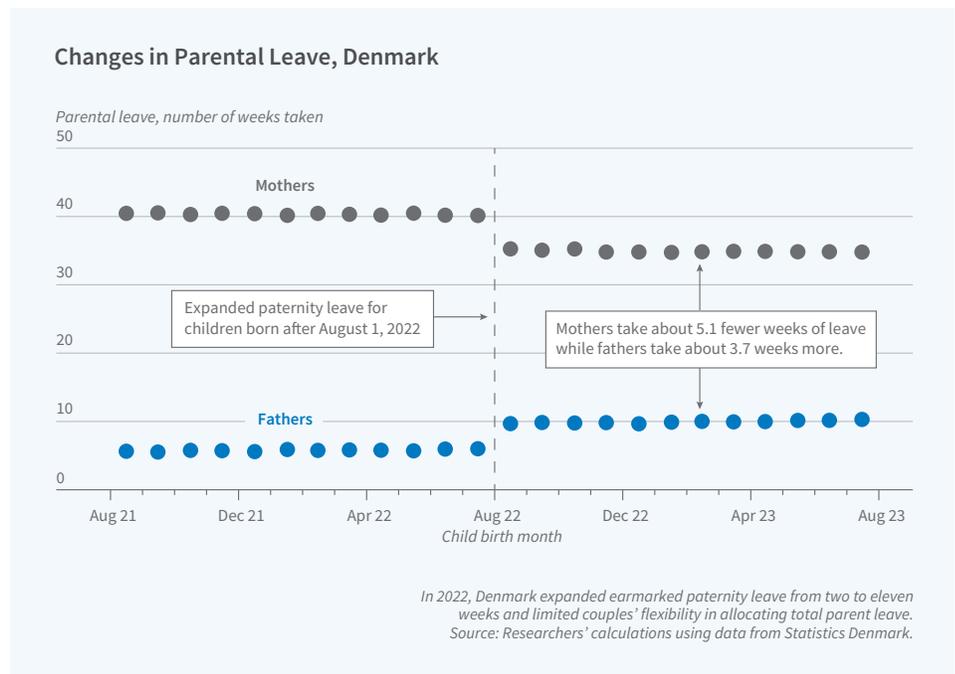
The researchers acknowledge support through the NSF CAREER award.

The Impact of Expanding Paternity Leave

A recent European Union directive requires member states to provide at least two months of earmarked paternity leave. In [Expanding Paternity Leave: Effects on Beliefs, Norms, and Gender Gaps](#) (NBER Working Paper 34862), Henrik Kleven, Camille Landais, Anne Sophie S. Lassen, Philip Rosenbaum, Herdis Steingrimsdottir, and Jakob Egholt Søgaaard study the effects of expanding earmarked paternity leave in Denmark. For fathers of children born after August 1, 2022, the reform increased earmarked paternity leave from two to eleven weeks. This increase was funded by restricting parental leave that had previously been freely transferable between parents. This had the effect of reducing the maximum leave available to mothers from 46 to 37 weeks.

The researchers fielded a survey of roughly 40,000 parents of newborns, with responses linked to full-population Danish administrative records. The survey elicited detailed beliefs and attitudes toward gender roles and childcare. It was first administered when the child was 4 months old, and then repeated at 18 months.

The reform produced large changes in leave-taking behavior. Fathers increased their leave by 3.7 weeks on average, while mothers reduced their leave by more than 5 weeks. Fathers' share of total household leave rose from approximately 12.4 percent to 20.5 percent. The reform also increased parents' support for earmarked paternity leave, with an average effect of about 0.05 for mothers (0.06 for fathers) on a policy-support index scaled from zero to one. Treatment raised the perceived social and workplace acceptability of paternity leave and increased recognition of its importance for the father-child bond.



Expanding paternity leave in Denmark shifted the parental allocation of leave and narrowed gender gaps in earnings, but reduced parents' satisfaction with their leave arrangements.

The percentage of respondents who agreed that preschool children suffer when their mothers work full-time fell by 0.031 among mothers, and the perceived gap between mothers' and fathers' childcare abilities narrowed at all child ages. The gender-beliefs index declined by 0.023 for mothers and 0.020 for fathers. Effects were driven entirely by families actually exposed to the reform—those who would have taken less than 12 weeks of paternity leave absent the policy change—and were roughly 2.5 times larger among first-time parents than among those with higher-parity births.

The gender gap in earnings in the first year after childbirth fell by about 34 percentage points and the gap in hours worked fell by about 33 percentage points. More notably, even

after both parents had returned to work, the earnings gap still fell by 2.8 percentage points and the hours gap by 1.4 percentage points. Relative to child penalties in Denmark of roughly 20 percent in earnings and 10 percent in hours, the reform reduced child-related gender inequality by about 14 percent.

One cost of earmarking is that the reform reduced leave satisfaction. Before the reform, about 90 percent of both mothers and fathers reported satisfaction with their leave allocation; afterward, this fell to about 50 percent for mothers and 60 percent for fathers. Both groups attributed their dissatisfaction to a preference for allocating more leave to mothers, and nearly all respondents agreed that parents should be free to divide leave as they choose.

The researchers acknowledge funding from the Carlsberg Foundation (Infrastructure Grant #CF21-0171), the Independent Research Fund Denmark (grant #4750-301280), and the Danish National Research Foundation (grant #DNRF134). Camille Landais acknowledges funding from the European Research Council (GENEQUALITY consolidator grant) and from the Gates Foundation.

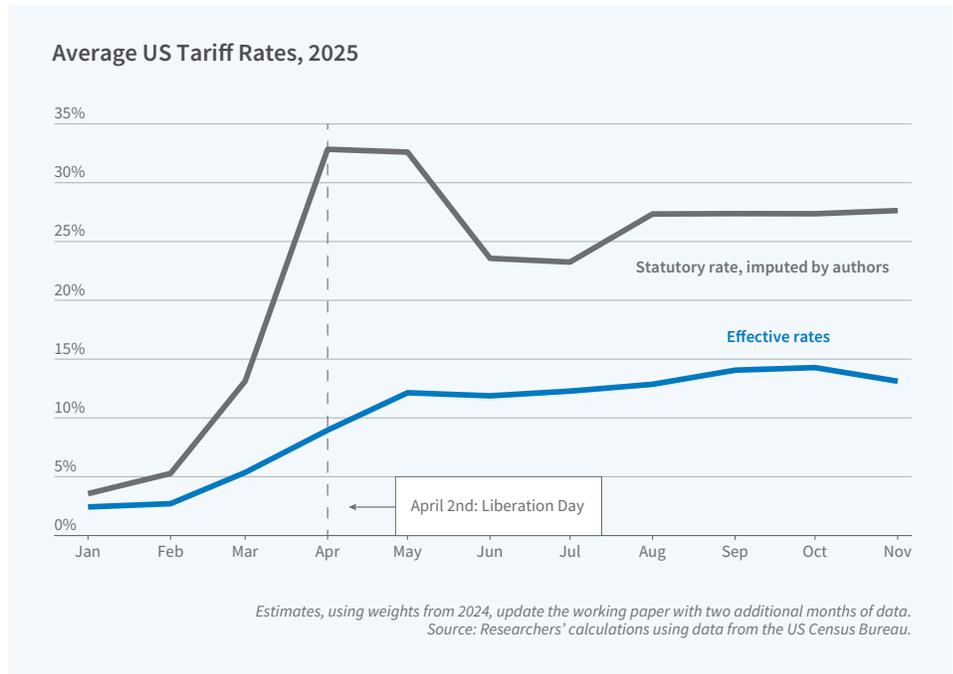
The Pass-Through of US Tariffs

In September 2025, the US trade-weighted average statutory tariff rate stood at 27 percent, the highest in over a century. Tariffs applied to purchases from 176 countries that together accounted for more than 70 percent of total US imports. In [The Incidence of Tariffs: Rates and Reality](#) (NBER Working Paper 34620), [Gita Gopinath](#) and [Brent Neiman](#) analyze the 2025 US tariff episode as well as the 2018–19 experience to determine who bears the costs of tariffs and how they reshape American commerce.

The researchers' analysis of US Census Bureau data covering 19,000 product categories finds that in September 2025, the actual tariff rate paid was 14.1 percent, roughly half the statutory rate of 27.4 percent. This gap was the result of four factors: shipping lags and an “on-the-water exemption” that delay the implementation of tariffs, product- and company-specific exemptions, increased utilization of the United States-Mexico-Canada Agreement (USMCA), and uneven enforcement or evasion. USMCA utilization rates jumped from below 50 percent in 2024 to nearly 90 percent in September 2025.

The researchers estimate pass-through rates of 80 percent for the 2018–19 tariffs and 94 percent for the 2025 tariffs, meaning US importers bore most of the tariff costs as foreign exporters generally did not reduce their prices. This finding of high pass-through held broadly across most countries and sectors.

China's share of US goods imports



Actual 2025 tariffs were only about half as large as announced tariffs. They passed through almost entirely to the tariff-inclusive price of imports.

fell from 22 percent at the end of 2017 to 12 percent by late 2024, and dropped sharply to just 8 percent by September 2025. Countries like India and Vietnam gained market share, though the extent to which this represents genuine production shifts versus transshipment of Chinese goods remains an open question.

Using input-output data, the researchers calculate “production tariffs”—hypothetical tax rates on total production costs that would have equivalent impacts as the import tariffs. For US manufacturing overall,

production tariffs increased by 1.06 percentage points in 2025. Some heavily affected sectors saw increases exceeding 2 percentage points, including heavy-duty trucks, which faced a 3.9 percentage point increase due to its reliance on imported steel and vehicle parts. The researchers find suggestive evidence that these production tariffs pass through to producer prices: 86 percent of manufacturing sectors with production tariff increases exceeding 2 percentage points exhibited above-trend price increases in 2025.

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