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Shifting Employment and Earnings, and US Earnings Inequality

Most of the growth in earnings inequality in the United States over the last several decades can be explained by employment growth and changes in earnings differentials in about 10 percent of all industries, at both the top and bottom of the earnings distribution, rather than by rising inequality of earnings within firms or between firms within industries. Many of these industries, which include software publishing, a high-earnings industry, and restaurants, a low-earnings one, are increasingly characterized by the presence of very large firms.

These are the central findings of [John C. Haltiwanger](#), [Henry R. Hyatt](#), and [James Spletzer](#) in [Industries, Mega Firms, and Increasing Inequality](#) (NBER Working Paper 29920). The researchers analyze administrative data for workers aged 20 to 60 during the years 1996 to 2018. Their sample includes earnings of 758 million worker-years. They consider only individuals with annual real earnings above \$3,770 in 2013 dollars, roughly 13 weeks of employment at an hourly wage of \$7.25.

Most employers in the United States are subject to state unemployment laws and must provide states with wage records on every employee in the firm.

Eighteen states that have data available from 1996 on are used in the analysis, representing roughly 44 percent of national employment. The underlying wage and employer data stem from the Longitudinal Employer-Household

industry, and location.

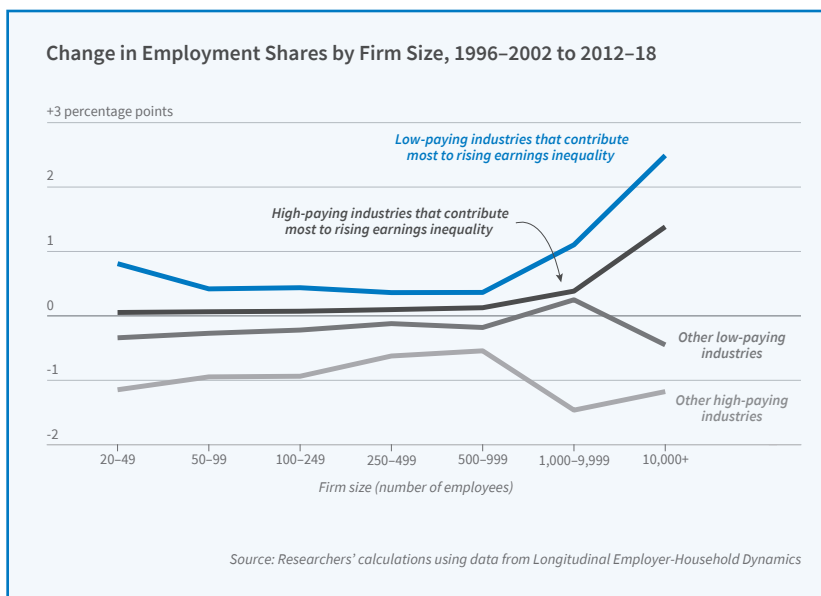
The researchers focus on the variance of the natural logarithm of real annual earnings as their key measure of earnings dispersion. It rose from a value of 0.794 in the 1996–2002

Changes in the share of the workforce employed in different industries and changing earnings differentials across these industries have been key drivers of rising earnings inequality.

Dynamics (LEHD) partnership with states at the US Census Bureau. Integration of the employee wage records and employer data yields the LEHD data infrastructure that includes information about an employee's earnings, age, gender, and education, as well as details about the employing firm's size, age,

period to 0.915 in 2012–18. They decompose this increase into constituent parts, and find that 61.9 percent was due to increased earnings dispersion between industries. Only 14.9 percent was due to rising variation within firms. Differences between firms in the same industry accounted for just 23.1 percent. The researchers aggregated firms into 301 industries using the 4-digit North American Industry Classification System.

Earnings in each industry were ranked from the first to the 99th percentile. Real annual earnings declined between the 1996–2002 and the 2012–18 periods for the first 61 percentiles. Real earnings in the top 23 percentiles increased. Changes within firms in the same industry and between firms in the same industry made only a modest contribution to the changing earn-



ings distribution for the first 87 percentiles.

About 10 percent of the industries—30 of the 301—accounted for 98.1 percent of between-industry earnings variance growth. These industries accounted for 39.3 percent of total employment, and their employment share increased by 8.2 percentage points over the sample period. The five industries contributing the most to increasing earnings dispersion were Restaurants and Other Eating Places,

Other General Merchandise Stores, Software Publishers, Computer Systems Design, and Other Information Services.

Among these 30 industries, 19 are high paying, and 11 are low paying. Earnings rose substantially in the 19 high-paying industries. In more than half of them, the skill intensity of science, technology, engineering, and mathematics workers was more than five times the average for all industries. The increasing pay in

those industries accounted for about 30 percent of the total earnings inequality increase.

At the same time, a relatively small number of low-paying industries became even lower paying, especially at the largest firms. The increase in employment in these industries was responsible for nearly three-quarters of the 8.2 percent employment gain in the group of 30 industries driving the earnings inequality growth.

—Linda Gorman

Estimating the Long-Term Fiscal Capacity of the US

Responsible long-term fiscal planning requires an understanding of national fiscal capacity and the extent to which it is affected by economic circumstances, including the term structure of real interest rates and the projected future path of budget deficits or surpluses.

In [Measuring US Fiscal Capacity Using Discounted Cash Flow Analysis](#) (NBER Working Paper 29902), [Zhengyang Jiang](#), [Hanno Lustig](#), [Stijn Van Nieuwerburgh](#), and [Mindy Z. Xiaolan](#) estimate an upper bound on US fiscal capacity. Fiscal capacity must equal the present discounted value (PDV) of projected future budget surpluses. It depends both on the forecast stream of future cash flows as well as the discount rates that are used to aggregate them across time. Discount rates, in turn, reflect both the time value of money and the short- and long-term risk attributes of the cash flows.

At the currently low level of real returns, PDV calculations can be very sensitive to small changes in discount rates. While the interest rate on government bonds is often used to discount future government cash flows, the researchers argue that this discount rate does not account for the short-run and long-run fluctuations in deficits and surpluses. In the short run, both federal tax revenue and federal spending are strongly affected by the business cycle. US budget surpluses are procyclical, with larger surpluses when economic activity is strong, revenues are robust, and the

demand for government spending programs, particularly transfer programs, is below average. In the long run, debt is cointegrated with GDP and inherits its long-run risk. This pattern leads the researchers to argue that the appropriate risk premium to use when dis-

Discounted cash flow analysis suggests that the US government's fiscal capacity may be lower than the current market value of outstanding US Treasury debt.

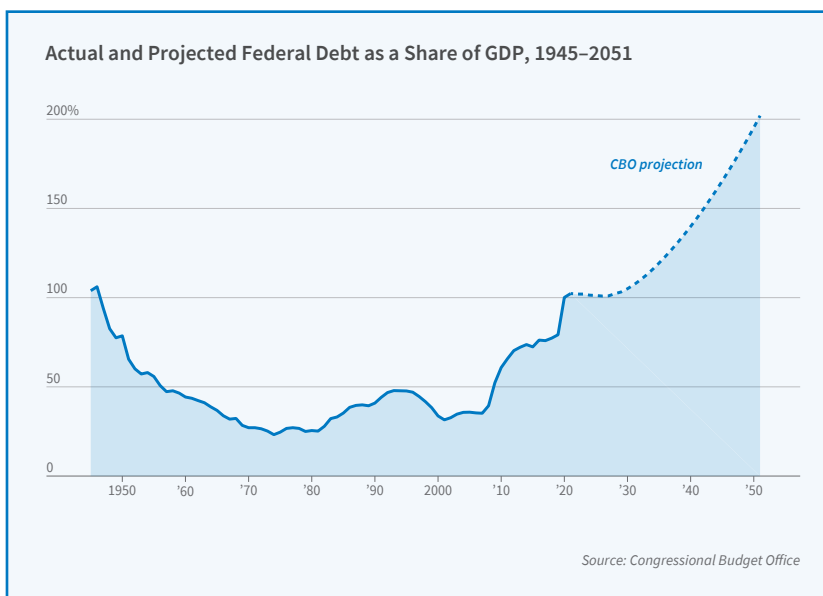
counting future surpluses must incorporate a “GDP risk premium.” They measure this premium as the average return on unleveraged equities relative to government bonds, which they estimate to be 2.6 percent per year at the end of 2021. They add this premium to the yield on long-term government bonds and use this as the discount rate in their calculations. They draw projections of budget surpluses and deficits from long-term analysis by the Congressional Budget Office (CBO).

The researchers begin by calculating the PDV of projected federal budget deficits between 2022 and 2051; this yields a value of \$21.6 trillion. They then calculate the PDV of the CBO's projection of US government debt in 2051, whose value is \$31.6 tril-

lion. This \$31.6 trillion reflects surpluses after 2051. Subtracting the PDV of deficits from the PDV of debt results in a fiscal capacity estimate of about \$10 trillion, which could support other liabilities.

The researchers note that US Treasury yields are below yields on risk-free assets because of their status as safe-haven assets. The resulting seigniorage revenue adds another \$3.7 trillion in PDV to the fiscal capacity, bringing it to around \$13.7 trillion. This value

is well below the roughly \$23.5 trillion of current US Treasury debt outstanding. To equate current outstanding debt with fiscal capacity would require the US to run surpluses of 3.3 percent of GDP in every year from 2022 until 2051, rather than deficits averaging 3.7 percent of GDP, as the CBO currently projects. They point out that while it is possible that participants in the market for US Treasuries anti-



pate significant future fiscal changes that are not embodied in the CBO projection, the changes that would be required to close the capacity shortfall are very large.

They also observe that because prospective government surpluses accrue in the dis-

tant future, the duration of the financial claim associated with these surpluses, greater than 50 years, is much longer than the duration of outstanding government debt—about 5 years. A 1 percent increase in the interest rate, holding projected nominal GDP and primary

surpluses constant, therefore results in a large increase in the projected debt-to-GDP ratio in 2051. This increase is the equivalent of a 2.9 percent increase in the primary surplus as a share of GDP in every year after 2051.

—Kevin Tasley

Design Trade-Offs for Electric Vehicle Charging Networks

A range of public policies, including funding the construction of electric vehicle (EV) charging stations, are designed to promote a transition from gasoline-powered to electric cars. A study of driver behavior suggests that drivers' willingness to embrace EVs will depend on the way funds for charging infrastructure are spent.

In **Fueling Alternatives: Gas Station Choice and the Implications for Electric Charging** (NBER Working Paper 29831), Jackson Dorsey, Ashley Langer, and Shaun McRae analyze driving data from a study of vehicle safety systems to inform the design of EV charging networks.

The researchers use high-frequency GPS data on individuals' driving patterns, refueling stops, and nearby gas station prices over the period April 2009 to May 2010 in southeastern Michigan to estimate the value that drivers place on their time. They observe that a typical driver chooses to refill at a gas station that is less than a minute off their planned route, despite the opportunity to save an average of 9 cents a gallon by traveling up to a minute longer to a less-expensive station. Based on these decisions, the researchers estimate that on average, drivers value their time at \$27.54 an hour, or 89 percent of the local median wage. This value of time is substantially higher than the estimate used by the US Department of Transportation, which is 50 percent of wages. By using a lower value of time, policymakers are likely to understate the benefits of time-saving transportation investments such as EV charging infrastructure.

Charging infrastructure is uncommon in multifamily housing complexes: only a quarter of apartment residents have access to overnight charging. In part for this reason, homeowners are much more likely to purchase EVs than are apartment dwellers. Using their estimate of the

station visit, by comparison, increased travel time by only 2.5 minutes. This implies that the additional time cost of recharging an EV at a public station, over the life of a vehicle, would be \$9,169.

This large cost difference is of particular

Public investments in faster electric vehicle charging stations, rather than more stations on the network, yield greater benefits per dollar spent.

value drivers place on their time, the researchers estimate that home charging and avoided trips to the gas station could save EV owners time worth \$829 over the life of their car. For those without the option to charge at home, however, the long wait time for charging at

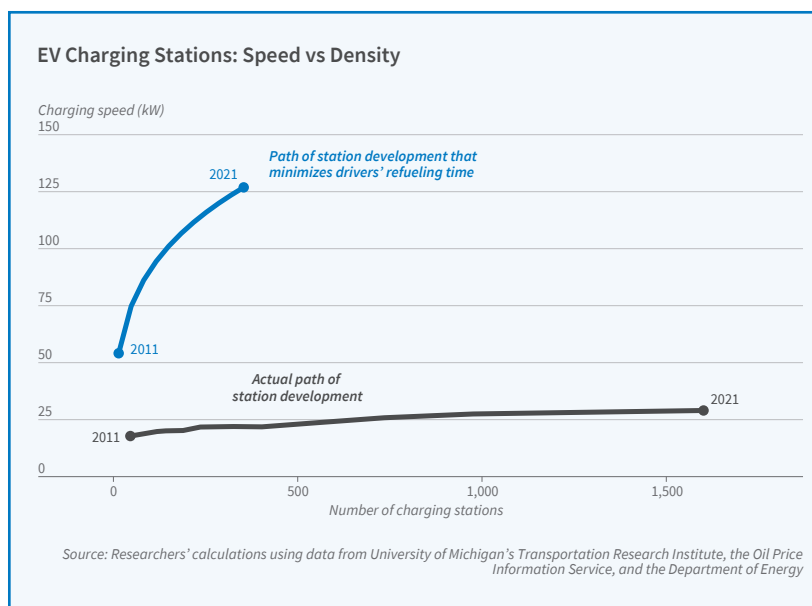
relevance due to the recent passage of the 2021 Infrastructure Investment and Jobs Act, which provides funding for 500,000 vehicle charging stations. The researchers suggest that drivers would place greater value on policies that support investment in faster charging stations than

on investment in additional stations with slower charging capability. In terms of time saved, a 1 percent increase in average charging speed would save 4.7 times more than a 1 percent increase in the number of charging stations. Fast charging is, however, expensive. Tesla DC Superchargers, which can charge more than 10 times faster than the average charger, also cost nearly 10 times as much. In 2021, less than 20 percent of US charging stations offered DC fast charging. Given the existing network, the researchers estimate that the return to

additional investment in charging speed was nearly 5 times greater than the return to additional investment in the number of stations.

Given the high value that drivers place on their time, prioritizing faster charging stations could provide important support to the transition to electric vehicles.

—Steve Maas



public stations imposes a significant time penalty. The researchers estimate that recharging an EV at a public charging station would add 30.6 minutes to drivers' travel times on average, through a combination of time spent waiting for vehicles to charge and time spent walking from a charging station to a final destination while vehicle is left to charge. The average gas

Exploring Links between Hospital Pricing and Quality of Care

Over the last two decades, the US hospital sector has experienced significant consolidation, with over 1,600 mergers among the nation's 6,000 hospitals. Nearly 70 percent of hospitals are now located in a highly concentrated market. During this period, according to the Bureau of Labor Statistics, prices for hospital services have grown more quickly than prices in virtually all other sectors. Legislators in various state houses and the US Congress have put forward proposals to regulate hospitals' prices.

In **Do Higher-Priced Hospitals Deliver Higher-Quality Care?** (NBER Working Paper 29809), Zack Cooper, Joseph J. Doyle Jr., John A. Graves, and Jonathan Gruber test whether patients who get treated at higher-priced hospitals receive better care, and whether there is a different price/quality relationship in concentrated versus unconcentrated hospital markets. They argue that before proceeding with price regulation, it is vital to understand whether high hospital prices reflect patients' lack of options for care due, for example, to a lack of competition, or their willingness to pay for quality.

The core empirical challenge the authors had to overcome was selection bias: sicker patients may be more likely to receive care from high-priced hospitals. To address this issue, the researchers looked at outcomes of patients who were transported by ambulance in an emergency, and who received nondeferrable care — care that occurs at the same frequency on weekends as it does during the week. The researchers exploit three aspects of the US ambulance system to get plausibly random assignment of patients to hospitals: 1) most regions of the US are served by multiple ambu-

lance companies, 2) ambulance companies are randomly assigned to pick up patients, and 3) ambulance companies have strong preferences for where

years, this is cost effective relative to the Environmental Protection Agency's \$8.7 million benchmark estimate of the value of a statistical life.

In competitive markets, patients are more likely to survive at higher-priced hospitals, but this pattern is not observed in concentrated markets.

they transport patients. Given these circumstances, the researchers are effectively comparing outcomes for patients from the same ZIP code who are transported to high- versus low-priced hospitals because of the ambulance company that was randomly assigned to transport them to the hospital.

In markets with more hospital competition, going to higher-priced hospitals raises spending by approximately 53 percent and lowers mortality by 47 per-

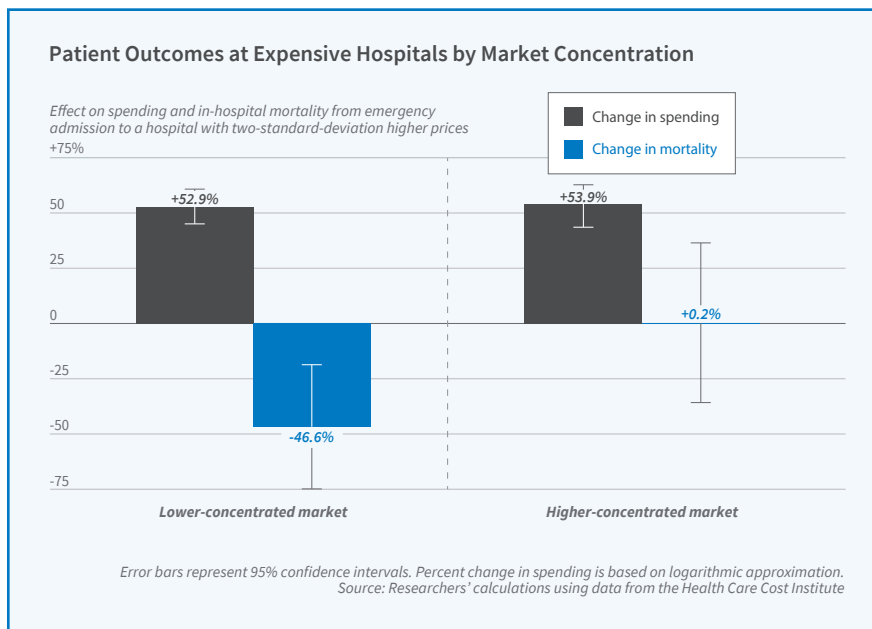
The study draws on data from the Health Care Cost Institute, which captures claims from nearly 30 percent of individuals in the United States covered by employer-sponsored insurance plans. The sample consists of more than 200,000 admissions to more than 1,800 hospitals between 2007 and 2014.

The researchers construct a price index for each hospital based on negotiated prices paid by insurers and adjusted for each facility's mix of patients and services. They define a market as concentrated if its Herfindahl-Hirschman Index (HHI) exceeds 4,000, a figure used as a trigger point for price regulation in several policy proposals. HHI is calculated for each hospital using the number of hospital beds accessible within 30 minutes of travel from it. The index ranges from 0 to 10,000, with 10,000 representing a hospital with a monopoly position.

The researchers point out that price caps in competitive markets

could have the unintended consequence of discouraging hospitals from making investments to improve care. With regard to concentrated markets, however, they observe that "high prices likely reflect patients' lack of alternative options, not hospital quality." They note that the challenge in designing price caps for any market is setting the caps high enough to avoid an adverse effect on quality.

— Steve Maas



cent. By contrast, in concentrated hospital markets, receiving care from a high-priced hospital also raises spending by 54 percent, but has no impact on patient outcomes. Notably, the higher spending that occurs at high-priced hospitals in less concentrated markets is potentially cost effective. Such hospitals spend approximately \$1 million per life saved. Assuming that the individuals in the research sample live for another nine

The Distribution of Paycheck Protection Program Funds

The Paycheck Protection Program (PPP) was one of the largest measures undertaken by the federal government to protect businesses and their employees from the adverse economic effects of the COVID-19 pandemic. It was authorized by the Coronavirus Aid, Relief, and Economic Security (CARES) Act in March 2020, and administered by the Small Business Administration (SBA). PPP guaranteed about \$800 billion in low-interest loans made by financial institutions to businesses with up to 500 employees, promising to forgive those loans if borrowers maintained employment.

Almost from the program's beginning, questions were raised about who was getting the loans and whether the distributions were fair. Answering these questions is challenging, however, because of a lack of data on eligible firms and their owners.

Racial Disparities in the Paycheck Protection Program

(NBER Working Paper 29748), [Sergey Chernenko](#) and [David S. Scharfstein](#) offer a solution by studying the take-up of PPP loans by Florida restaurants. This enables the researchers to determine the racial and ethnic identity of the owners of a population of eligible firms for which they have detailed firm characteristics. They

match data from restaurant licenses, corporate records, voter registrations, and Yelp to records from the PPP and the COVID-19 Economic Injury Disaster Loan (EIDL) program, which was also administered by the SBA and offered long-term, low-interest loans to firms adversely affected by the pandemic. Unlike the PPP, EIDL loans were not forgivable and, crucially, firms applied directly to the SBA for approval, rather than to an intermediary such as a bank.

The researchers find that Black-owned

restaurants were 25 percent less likely to receive PPP support than their White-owned counterparts. Hispanic-owned restaurants were 9.1 percent less likely to receive PPP loans than White-owned establishments. Disparities in overall PPP borrow-

ing were driven by disparities in bank borrowing. Black-owned restaurants were 33.6 percent less likely than White-owned restaurants to receive PPP loans through banks, and Hispanic-owned restaurants were about 10 percent less likely. Some of the disparities were offset by greater borrowing from nonbank PPP lenders—mostly fintechs.

Black-owned restaurants in Florida were 25 percent less likely, and Hispanic-owned restaurants 9.1 percent less likely, to receive PPP loans than their White-owned counterparts.

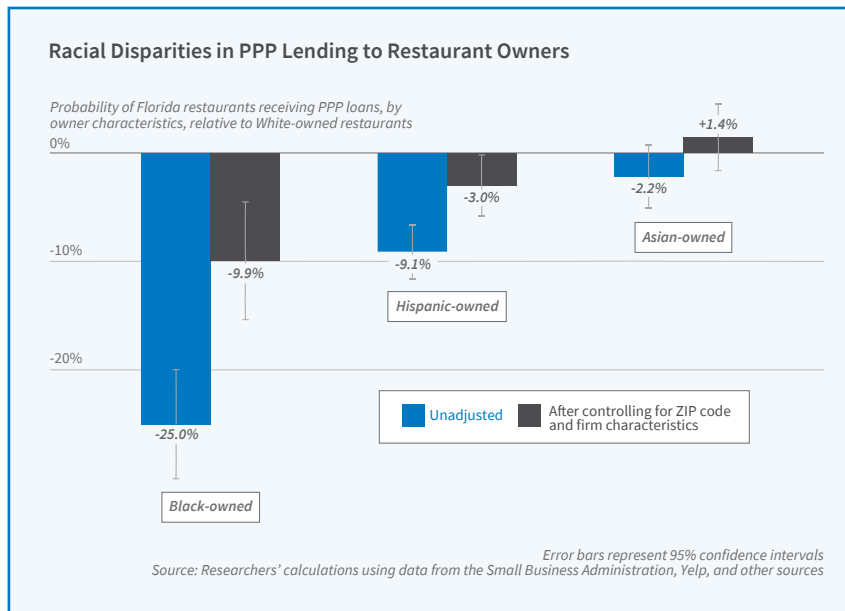
minority neighborhoods—were less likely to get PPP loans. Restaurant characteristics, gleaned from Yelp, accounted for another 40 percent of the disparity: older, larger, and more heavily visited and reviewed restaurants, which tended to be White-owned,

were more likely to receive PPP funding.

The researchers also present evidence that racial bias contributed to the observed disparities. Using data collected by Project Implicit on explicit and implicit racial bias across Florida counties, they note that an increase of one standard deviation in the measure of explicit bias in a county was associated with a 13.9 percent decline in the likelihood that a Black-owned restaurant received a PPP loan from a bank. Black-owned restaurants in counties with greater racial bias were much more likely to substitute to PPP loans from fintechs. The researchers point out that while it is possible that racial bias directly affected the application process for Black-owned businesses, it is also possible that a history of poor treatment by banks in more racially biased counties dissuaded Black-owned firms from even applying to banks.

Finally, the researchers show that their results apply not just to restaurants but to firms in all industries. To measure the take-up of PPP loans by firms in other industries, the researchers study firms that received EIDL Advance grants, a sample of firms that were likely aware of the PPP and eligible for the program. The researchers find that, as in the sample of restaurants, disparities were driven by disparities in bank borrowing, and that location, firm characteristics, and racial bias were also important.

—Brett M. Rhyme



These disparities did not exist in the EIDL program; if anything, minority-owned restaurants, particularly Hispanic-owned ones, were more likely to receive EIDL loans.

The researchers examine a variety of factors that could explain the lower rates of bank PPP borrowing by Black- and Hispanic-owned restaurants. Location accounted for 20–30 percent of the disparity: restaurants in ZIP codes with fewer bank branches per capita, lower household income, and more COVID cases per capita—all attributes of

Italian Catholic Churches' Role in the Assimilation of Immigrants

Rising international migration flows have sparked heated debate on the effects of immigrants on host societies. A recurring concern is that cultural differences between immigrants and the native born and the insularity of some immigrant communities threaten social cohesion and national identity. Such concerns are often linked to religion, which is not only a dimension along which immigrants and natives tend to differ, but also an important determinant of culture, beliefs, and morals.

In **Faith and Assimilation: Italian Immigrants in the US** (NBER Working Paper 30003), **Stefano Gagliarducci** and **Marco Tabellini** explore how ethnic religious organizations influence immigrants' social, cultural, and economic assimilation in host societies. They focus on Italian Catholic churches in the United States between 1890 and 1920, the Age of Mass Migration. During this period, 4 million Italians moved to America and anti-Catholic sentiments were widespread. The researchers collect and digitize detailed historical records on the arrival and presence of Italian Catholic priests and churches that were specifically identified as serving the Italian community. By combining this information with US census data, they can trace the effects of religious organizations on immigrants' integration.

Access to Italian Catholic churches lowered the probability that Italian immigrants married or inte-

grated with native-born people of native parentage. Five additional years of exposure to an Italian Catholic church reduced intermarriage rates and residential integration by 0.5 and 2 percentage points, respectively—61 percent

Immigrants in communities served by these churches displayed higher labor force participation but had lower quality jobs and a lower rate of naturalization.

and 13 percent, relative to the 1900 mean.

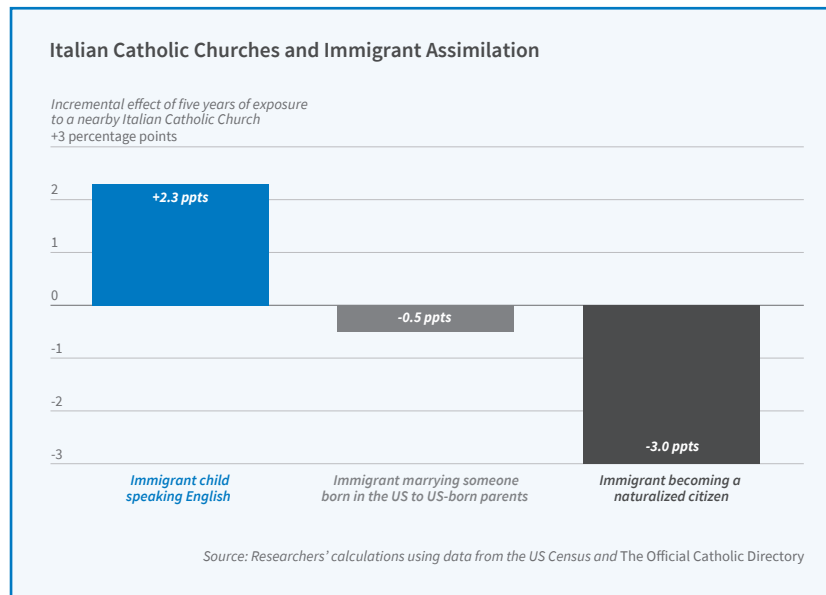
Exposure to Italian churches also lowered immigrants' naturalization rates, suggesting less interest in political participation, and increased parental desire to transmit their culture and values to the next generation. Exploiting naming patterns within Italian families, the researchers show that children born to immigrants after an Italian church was established near them were more likely to be named after a Catholic saint relative to siblings born in the US of the same parents before the arrival of the church.

Italian churches had ambiguous effects on immigrants' economic outcomes. With their presence, Italians' labor force participation increased but their occupational standing and the quality of their jobs decreased.

Moreover, Italian immigrants living in counties more exposed to these churches were more likely to specialize in what were thought of as "Italian" occupations, such as bootblack, barber, and fruit grader. The patterns suggest that Italian priests made it easier for immigrants to find jobs via their ethnic networks, but that such jobs limited the opportunities for occupational upgrading.

While the findings suggest that Italian churches reduced the social and economic assimilation of Italian immigrants, they may have helped immigrants on other dimensions, including by providing education. Catholic churches often were associated with schools for immigrant children. The researchers find that immigrant children born in Italy who grew up in US counties with longer exposure to Italian churches were more likely to speak English and to be literate. They find that this pattern was more pronounced in areas with an Italian church with an associated school.

—Lauri Scherer



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