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Legal Changes in the 1960s Narrowed the Gender Pay Gap

Two landmark pieces of federal legislation in the early 1960s targeted pay discrimination against women. In [How the 1963 Equal Pay Act and 1964 Civil Rights Act Shaped the Gender Gap in Pay](#) (NBER Working Paper 31332), [Martha J. Bailey](#), [Thomas E. Helgerman](#), and [Bryan A. Stuart](#) present new estimates of how these bills affected gender-based pay disparities.

The study analyzes data from the 1950–60 Census and the 1962–75 Annual Social and Economic Supplements of the Current Population Survey. It excludes individuals in the agriculture, forestry, and fishing industries and those who report being self-employed.

The researchers employ two different empirical strategies. First, they test the hypothesis that the bills had a greater impact in the 28 states that did not have preexisting equal pay laws, a pattern consistent with federal antidiscrimination legislation having larger effects in states without prior protections. They find that women's weekly wages rose by 9 percent more in those states, which were primarily located in the South and the western Midwest, than in the 22 states with preexisting laws. The gains were greater in the mid-1960s than in the later part of the decade and much

larger among women than men.

Second, the researchers show that the federal legislation had a greater impact on

that women's wages grew by 11 percent in jobs with the average gender pay gap. The impact was similar for White and Black

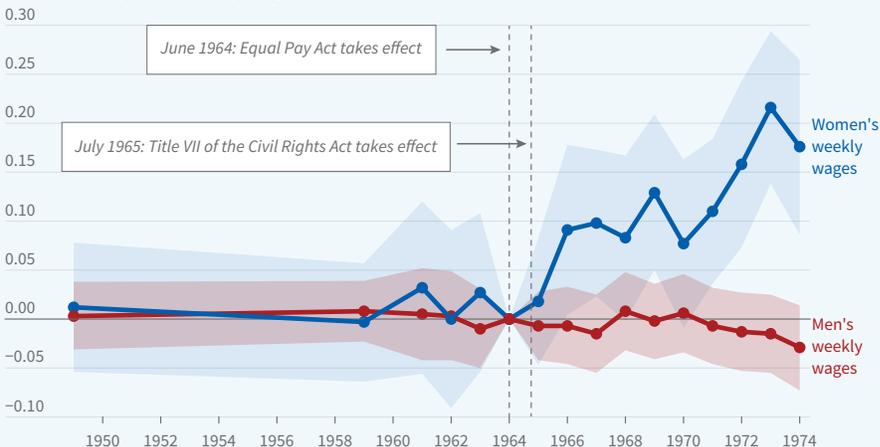
Passage of antidiscrimination legislation in the early 1960s was followed by substantial relative growth in women's wages.

women's wages in jobs with larger preexisting pay gaps, a pattern consistent with federal antidiscrimination legislation having greater effects in jobs with more gender discrimination. This analysis suggests

women, suggesting that the Civil Rights Act was not a key factor, and the women's gains do not appear to have come at the expense of men's wages. The researchers do not find differences in the growth

The 1964 Equal Pay Act and 1965 Civil Rights Act and Weekly Wages

Estimated change in weekly wages, log points



Shaded areas represent 95% confidence intervals
Source: Researchers' calculations using data from the US Census

rate of men's wages after 1964 in job categories with large and small gender wage disparities.

The researchers note that their results suggest that the federal legislation had its greatest impact on lower-paying jobs,

where it is easier to measure job comparability. They also find that these laws had little effect on median wages among full-time, full-year workers, which is the sample tracked by the Census Bureau. They also point out that an influx of

women into the US labor force during the 1960s may have created downward pressure on women's wages, thereby reducing the apparent impact of the legislation in the time series.

—Steve Maas

The Role of Mega Firms in Patenting and Follow-On Innovation

“Mega firms,” defined as the 50 publicly traded firms in the US with the highest annual sales, hold a disproportionate share of novel patents and may play a key part in spreading innovative ideas to smaller firms, [Serguey Braguinsky, Joonkyu Choi, Yuheng Ding, Karam Jo, and Seula Kim](#) found in [Mega Firms and Recent Trends in the US Innovation: Empirical Evidence from the US Patent Data](#) (NBER Working Paper 31460).

The researchers compared the time trends in novel patent filings (patents combining technological components never combined before). They found that mega firms' share of novel patents granted by the US Patent and Trademark Office (USPTO) among all patenting entities increased from about eight percent in the early 2000s to around 17 percent by 2016 (from about 14 percent to around 33 percent among publicly traded firms). Furthermore, since 2007, mega firms' novel patents were disproportionately likely to spark follow-on patenting, additional patents using the same combination of technologies, within five years after a patent grant. These follow-on patents were more likely to be assigned to other entities, not the mega firms responsible for the initial novel patent, a finding that calls into question claims that mega firms prevent diffusion of new knowledge within their industries.

The researchers combined three data sources to develop a dataset integrating key business information and details of the patents filed by those businesses. They used the PatentsView dataset, comprising all patents granted by the USPTO since 1976, to

access information about patent filings and the technological components they contained. They also used S&P's Compustat data on all publicly listed firms in the US as well as VentureXpert data on startups

The researchers also found a shift in the nature of patent filings. In the 1991–2000 period, 62 percent of novel patents combined two information and communications technologies (ICTs), while in

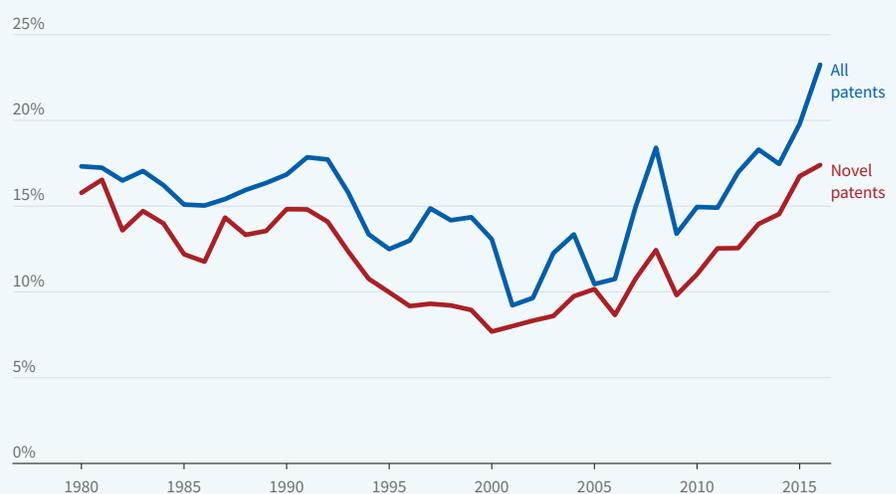
The share of novel patents held by very large publicly traded US firms has risen sharply since the 1990s. Since 2007, novel patents held by these firms are disproportionately likely to spark further development.

backed by venture capital. Together, these datasets allowed them to track individual patents — and novel technology combinations in those patents — filed by companies and researchers. They used the data on filings by all patenting companies as their baseline, and compared that to the filings by mega firms and venture capital-backed startups.

the 2007–16 period, 55 percent combined an ICT component with a non-ICT component.

Mega firms, alongside with VC-backed startups, were disproportionately likely to have a “hit” patent, defined as a patent in the top 1 percent when ranked by the number of follow-on patents. Furthermore, there was significant overlap between

Mega Firms' Share of Total and Novel Patent Applications



Mega firms are the top 50 firms by sales in any given year among all public firms in the Compustat data
Source: Researchers' calculations using data from the USPTO and Compustat

VC-backed startups and firms with a “hit” patent that grew to become mega firms after 2007. In contrast to patents filed by established mega firms, however, the fol-

low-on patents derived from novel patents filed by VC-backed startups were more likely to be filed by the startups themselves, rather than by other entities. The research-

ers conclude that mega firms are investing in new ideas that others can further develop.

—Emma Salomon

Banks That Relied on Branches, Not Remote Depositors, Fared Better in Recent Turmoil

The number of bank branches in the United States declined from 99,550 in 2009 to 79,186 in 2022, while total deposits significantly increased. Overall branch density fell from 20 branches per \$1 billion in deposits in 2010 to 9.2 branches per \$1 billion in deposits in 2022.

In [Bank Branch Density and Bank Runs](#) (NBER Working Paper 31462), [Efraim Benmelech](#), [Jun Yang](#), and [Michal Zator](#) find that stock prices of banks with low branch density experienced larger declines around recent bank failures. They attribute these declines to a greater risk of large deposit outflows.

The Summary of Deposits provides deposit data for all FDIC-insured institutions. The researchers use it to aggregate the number of branches and deposits to the bank holding company level. They distinguish banks with very low branch density, at or below the 10th percentile; low density, between the 10th and 50th percentiles; and high density, above the 50th percentile. The growth rates of deposits between 2010 and 2019 were higher for the very low-density group (98 percent) than for the low-density group (32 percent) or the high-density group (19 percent).

The researchers find that after controlling for bank size, deposits as a share of assets, the percentage of deposits that are insured, and estimates of mark-to-market losses, a 1 standard deviation decline in branch density, a drop of 5.8 branches per billion dollars in total deposits, was associated with 4 percent lower returns on the bank’s common stock around the time of the Silicon Valley Bank (SVB) collapse, and a 1.4 percent lower return

around the First Republic Bank collapse. Furthermore, between Q4 2022 and Q1 2023, a 1 standard deviation lower branch density is associated with a 4.4 percent

researchers provide the following two pieces of evidence.

First, they demonstrate that increased investment in information technology (IT)

Low values of branch density, the ratio of the number of bank branches to the bank’s total deposits, were negatively correlated with bank stock returns and positively correlated with outflows of uninsured deposits around Silicon Valley Bank’s collapse.

higher outflow of uninsured deposits.

The researchers posit that banks with lower branch density perform worse in episodes of distress because they attract depositors who access banking services via digital channels and have weaker relationships with banks. Digital services also tend to attract corporations that make large uninsured deposits and tech-savvy individuals who respond quickly to financial news. The

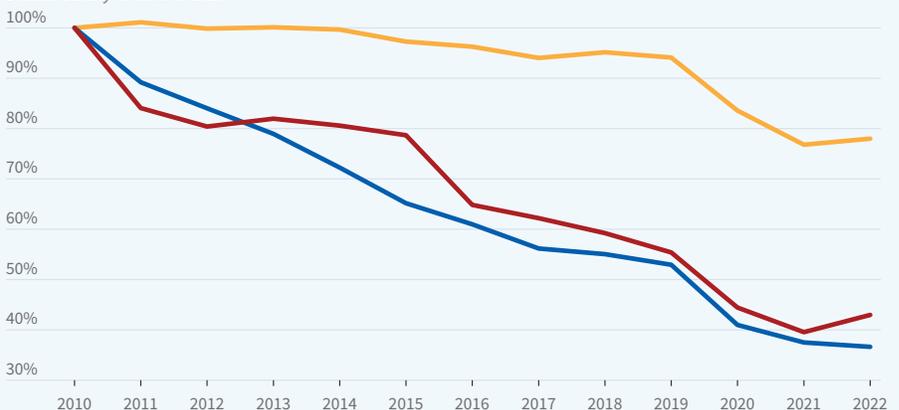
is correlated with decreasing branch density and deposit flows. They categorize banks into those below the 50th percentile in IT investments, those between the 50th and 90th percentiles, and those at the 90th percentile or higher. From 2010 to 2019, deposits in banks with very high IT investments grew 105 percent compared with 59 percent and 27 percent for banks with high and low IT investments, respectively.

Branch Density of FDIC-insured Banks, by Size

Density is the number of bank branches per \$1 billion of deposits

— 2010 assets ≥ \$1T — 2010 assets [\$10B – \$1T] — 2010 assets < \$10B

Branch density relative to 2010



The median of branch density within each group is plotted

Source: Researchers’ calculations using data from the Summary of Deposits

Second, traffic to bank websites was 15 percent higher during the collapse of SVB than in the prior six months. This increase was greater for

banks with lower branch density. A 1 standard deviation lower branch density corresponded to a 29 percent increase in online traffic. Higher online

traffic was also negatively associated with bank stock returns during the SVB and First Republic failures.

—Whitney Zhang

Racial Disparities in Foster Care Placement

In the United States, 5 percent of all children spend some time in foster care and 37 percent are involved in a maltreatment investigation by a child protective services agency by age 18. The percentage of Black children involved in such investigations is nearly double the percentage of White children, and Black children are also twice as likely as White children to spend time in foster care.

A new study examines whether these racial disparities reflect differences in underlying need for foster care placement, or discrimination by child maltreatment investigators.

In [Racial Discrimination in Child Protection](#) (NBER Working Paper 31490), Jason Baron, Joseph J. Doyle Jr., Natalia Emanuel, Peter Hull, and Joseph P. Ryan analyze data from the Michigan Department of Health and Human Services for the period January 2008 to June 2017. Their dataset includes 217,704 maltreatment investigations of 181,928 children by 699 investigators.

To understand whether placement disparities reflect differences in underlying need or discrimination, the authors compare the foster care placement rates of White and Black children with identical potential for future maltreatment if left at home—which they proxy for via another maltreatment investigation in the home within six months. The key challenge for this comparison is that maltreatment potential is unobserved for children who were placed in foster care, so it cannot be conditioned on directly. The authors overcome this missing data problem by leveraging the quasi-random assignment of child maltreatment investigators in Michigan, with an “identification at infinity” strategy.

The authors find that Black children

are 1.7 percentage points (50 percent) more likely to be placed in foster care than White children conditional on maltreatment potential. The interpretation of this finding is com-

plex: it could indicate “over-placement” of Black children in foster care, or “under-placement” of White children.

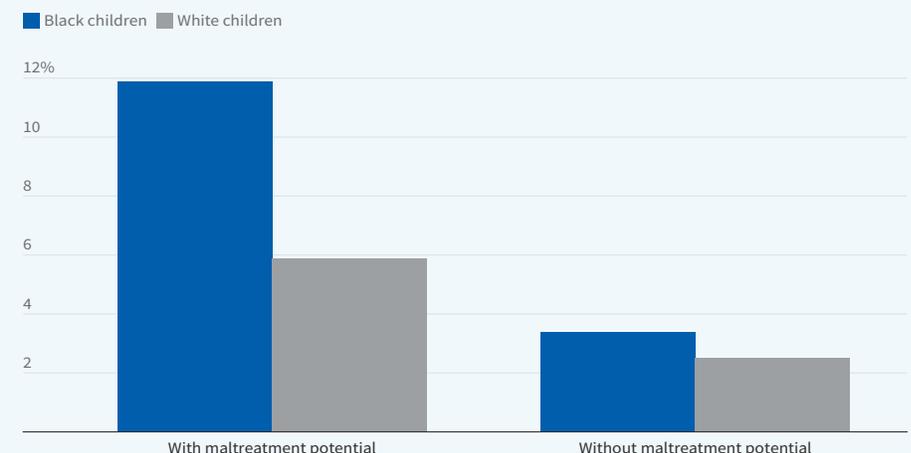
The researchers show that the conditional disparity is entirely driven by high-risk cases—those in which children would face subsequent maltreatment if left in the home. Specifically, they find that 12 percent of Black children are placed in foster care in such cases, compared to 6 percent of White children. In contrast, placement disparities are small and statistically insignificant in low-risk cases (where children face

no future maltreatment potential). These findings suggest that while Black children may be placed in foster care at higher rates than White children, White children may be harmed by “under-placement” in high-risk cases.

The study also shows that a key contributor to these racial disparities is own-race bias in high-risk cases: White investigators give more latitude to White parents than they do to Black parents. The same type of bias emerges for Black investigators, who are more lenient toward Black parents. But since most investigators are White, this own-race bias results in higher foster care placement rates for Black children in high-risk cases.

—Leonardo Vasquez

Racial Disparities in Michigan Foster Care Placement Rates



Foster care placement rates conditional on the child's risk of future maltreatment in the home
Source: Researchers' calculations using data from the Michigan Department of Health and Human Services

Financial Stress Can Squeeze the ‘R’ Out of R&D

A financial crisis can affect the economy’s long-term trajectory if it alters investment behavior. In [Research and/or Development? Financial Frictions and Innovation Investment](#) (NBER Working Paper 31521), [Filippo Mezzanotti](#) and [Timothy Simcoe](#) investigate the impact of the 2008 financial crisis on domestic research and development (R&D) expenditures by US firms. They find that firms in greater need of refinancing responded to the crisis by cutting back investment in R&D. Scientific research felt the brunt of the cutbacks, while product development was less affected.

The study analyzes a sample of around 1,100 large US firms and draws on census surveys for 2002–07 and 2008–12 that make it possible to disaggregate spending on research from that on development. Private firms account for 75 percent of total US domestic investment in R&D. Firms entering 2008 with a higher debt-to-liquid-assets ratio saw less R&D growth than peers within the same North American Industry Classification System category with a lower ratio. A 0.5 unit increase in the ratio was associated with an 8 percent decline in R&D spending. The decline came almost entirely from reduced spending on basic and applied research, and mostly from cutting employment.

The decline was not associated with pre-existing trends in the companies’ R&D activities. Moreover, the drop in R&D investment persisted beyond the crisis, perhaps because of the high cost of replacing highly skilled workers.

Basic and applied research is more vulnerable to the budget axe than product development or other activities with specific

commercial applications. Its goal is to generate new knowledge in the hope of a long-term payoff, in contrast to development research, which offers quicker, less speculative returns. Spending on development often

with greater exposure to the financial crisis. Patents fell by 6 to 7 percent over a three-to-five-year horizon, but these differences are not statistically different from zero. However, the quality of these patents

Cutbacks in corporate R&D spending during the Great Recession fell most heavily on budgets for basic and applied research.

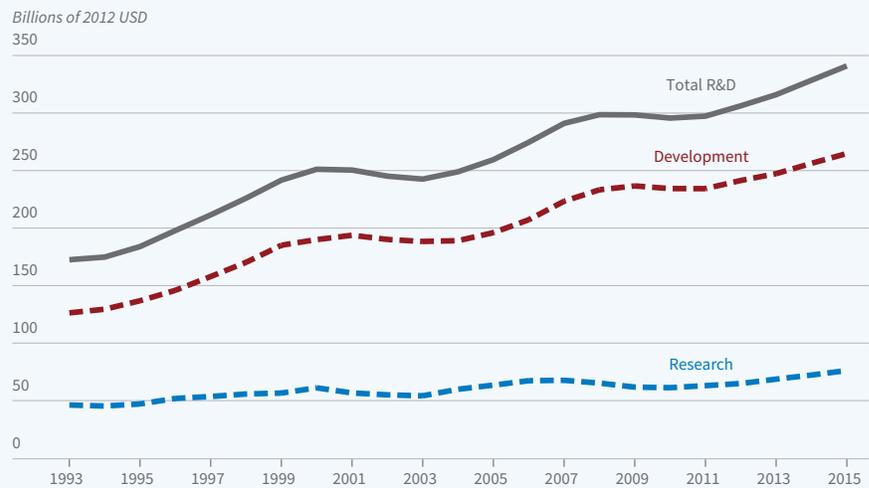
seeks to improve existing products or create new ones. The researchers suggest that development investment may be driven more by competitive considerations than by the financial environment. They conjecture that firms will reduce development investment in a crisis only if their rivals face similar problems, such as accessing credit.

The long-term economic impact of the R&D cutbacks can be seen in trends for patents and patent citations among firms

decreased significantly: patent citations fell by 16 to 19 percent over the same period. To explain these findings, the researchers show that development spending is more strongly tied to patents than research spending is. This evidence may explain why a change in R&D mostly achieved through a reduction in research may have small effects on the raw count of patents, but still deteriorate the quality of this output.

—Steve Maas

Research and Development Spending by US Businesses



Source: Researchers’ calculations using data from the National Science Foundation.

Consumer Inattention and Subscription Renewals

Companies increasingly are moving to subscriptions to sell everything from entertainment to security to

newspapers. This could be because digital goods and services lend themselves to subscription-based models, and consum-

ers appreciate the convenience. It could also be, however, because suppliers earn higher profits when subscribers fail to

cancel subscriptions they are not using.

In *Selling Subscriptions* (NBER Working Paper 31547), [Liran Einav](#), [Benjamin Klopock](#), and [Neale Mahoney](#) find that consumer inattention to subscription services boosts companies' revenues. Their estimate of the increase relative to what firms would receive if all consumers canceled their subscriptions as soon as they no longer valued them ranges widely, from 14 to more than 200 percent, depending on the circumstances.

The study examines monthly automatic subscription renewals for 10 digital and nondigital products in various merchandise categories. The data are drawn from transactions in a large domestic payment-card network that covers about 30 percent of all subscribers. The sample period is August 2017 to December 2021. The researchers find that when subscribers' credit cards are replaced and they have to take action — update their credit card information online — to keep their subscriptions going, many do not resubscribe. This is consistent with the subscriber having stopped valuing the subscription at some point before credit card replacement, but not having canceled it until the replacement forced action.

One potential concern with the researchers' interpretation of the observed drop in subscriptions is that the drop could reflect in part consumers' decisions to switch credit cards. If subscribers are waiting for a new card in the mail, they might use a different card to renew their subscription. However, when the researchers zoom out to exam-

ine non-subscription purchases, they find no evidence of substitution, indicating the phenomenon is not driven by consumer card-switching behavior, and

advances than those without.

The researchers analyze various policies that could increase consumer attention to their subscriptions. While

When subscribers' credit cards expire and they must take action to keep their subscriptions going, many choose not to renew.

is instead specific to subscription plans.

Inattention appears most prevalent among subscribers with the least financial sophistication. The researchers consider renewal behavior among subscribers who have used their credit card for a cash advance, which because of card fees and high interest rates is considered an expensive way to borrow and is a proxy for low financial sophistication. In most cases, the drop in subscriptions is sharper after card renewal for those with cash

requiring consumers to actively renew every month would eliminate excess payments, it would also eliminate the convenience of subscriptions. However, an intermediate policy of requiring consumers to make an active choice every six months could cut the revenue impact of inattention by half, suggesting it is possible to substantially reduce excess payments without a large convenience burden.

—*Laurent Belsie*

Subscription Lapses around Credit Card Expirations

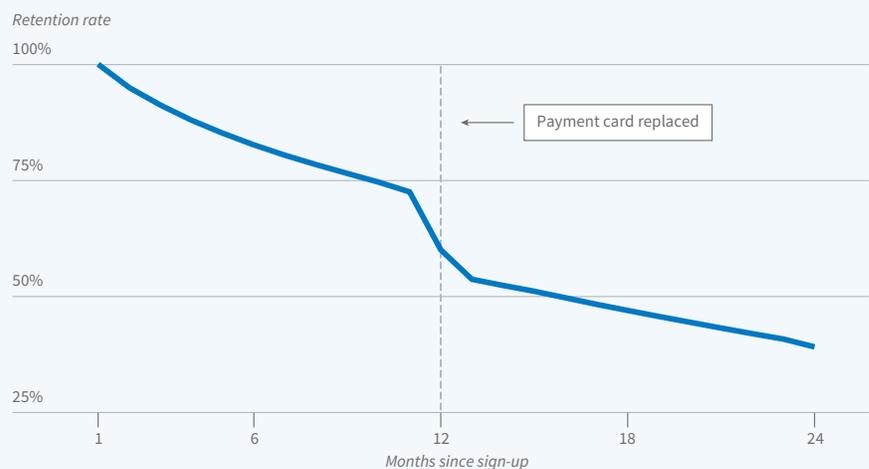


Figure shows the retention rate across cohorts whose payment cards are replaced 12 months after initial subscription. Source: Researchers' calculations using payment card network data.

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