

Economic Insights

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Inequality Research Review

The Economic Impact of the Opioid Epidemic

Not All Rush Hours Are the Same

Banking Trends

Q&A

Research Update

Data in Focus



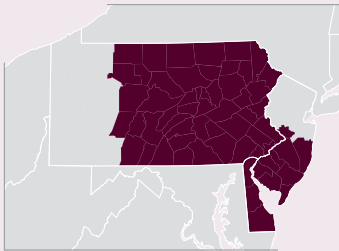
Economic Insights

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Economic Insights features nontechnical articles on monetary policy, banking, and national, regional, and international economics, all written for a wide audience.

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About the Cover

The Liberty Bell and Independence Hall

This issue's cover photo depicts the Liberty Bell, long associated with both Philadelphia and the United States of America. The bell was cast for the Pennsylvania State House in 1751 and bears the Biblical inscription, "Proclaim Liberty Throughout All the Land Unto All the Inhabitants thereof." After the American War of Independence, antislavery abolitionists embraced the inscription as their motto. In 1915, the bell was used to rally support in Pennsylvania for women's suffrage. To this day, people around the world celebrate the bell as a symbol of humanity's quest for liberty. The Pennsylvania state capital long ago moved to Harrisburg, and the Pennsylvania State House, visible in reflection in the glass walls around the bell, is now known as Independence Hall.

Photograph by Rich Wood.

Q&A...

with Ryotaro Tashiro,
a senior outreach
economist here at the
Philadelphia Fed.



Ryotaro Tashiro

Senior outreach economist Ryotaro Tashiro was born in rural Japan but had an itinerant childhood thanks to his father's research into economic growth strategies. He holds degrees in economics from Kenyon College and the University of Michigan. After a five-year stint researching equity data for Bloomberg, he joined the Philadelphia Fed, speaking to the public on behalf of the Bank and its economists. He also conducts our Chamber of Commerce Economic Outlook Survey, which is featured in this issue's Data in Focus.

Where did you grow up?

I mostly grew up in Tokyo, Hong Kong, and California. My father was a government official for a rural prefecture in Japan. They sent him to the U.S. in early 2000, when the Internet industry was booming, so he could help his prefecture do what Silicon Valley was doing. And then I stayed in the U.S. for college and graduate school.

It sounds like your father was involved in industrial policy.

Yes. He spent a lot of time in the government sector dealing with economic development. How do you appeal to the private sector? How do you help the private and public sectors connect? Having a father asking those questions was partly why I was drawn to economics.

What does your current position as a senior outreach economist entail?

I'm a bridge between the Federal Reserve and the public. Any group can request a speaker from our bank to speak about what's going on with the economy, what the Federal Reserve does, what we do in the Research Department. But I also ask people about what they're seeing day-to-day. If they own a business, I ask, how's their business doing? Is their experience consistent with the data that I just presented to the group? Sometimes after my presentation, people say, that's not what I'm seeing at all. And that's when the conversation gets very interesting. I also contribute to research projects, and many of those projects come from the conversations I have with public groups. Finally, I am responsible for the Chamber of Commerce Survey. It's a gauge of the experiences and expectations of business owners in the Third District.

In your March report, "Beyond Facts and Figures," you wrote, "Recent conversations with lenders and other professional services shed light on the increase in consumer credit card debt and home equity loans, indicating that many households are borrowing to supplement their income because their paychecks aren't enough to cover their needs." That was six months

ago. Are you still hearing the same problems during your outreach to lenders and other professional services? Or have the most-pressing challenges facing Third District individuals and families changed?

Things are not easy. But six months ago, it was more like, things are bad and it's becoming even worse. Now the conversation is closer to, things will stabilize. Home prices are still high. If you want to buy a car, it's a huge challenge. Groceries cost much more than a year ago. But maybe people have learned how to deal with inflation, or maybe they just stopped talking about it because things haven't changed that much from their perspective.

It sounds like the research you share with the public doesn't always match what the public is telling you.

When I go to the public, my main goal is to convey the analysis I'm seeing and to share some of the products and research that are produced here, but I would also like to hear about people's and business's experiences. One of the many things that we learned throughout the pandemic is that data are important. But we also found out that data can miss a lot of the nuance. It's important that people ask me questions, people give me comments, and people tell me when they agree or disagree with what I'm saying. That's extremely important for my job, and I report that back to senior management here.

So, it isn't just that you educate the public. The public also educates you.


It's a dialog. The people here at the Philadelphia Fed know more about what's going on from the high-level macroeconomic perspective. But people outside this building have experiences about what's going on in their local areas. They are a very good data source. We as researchers have been trained to think about quantitative analysis, and we make sure all our research is robust, but it's important to listen to the people. If one person says something, it may just be an anecdote. But if multiple people from the same area say the same thing, that may signal that we should be looking at certain issues more carefully. 



Photo: VioletaStoimenova/iStock

Inequality Research Review

Intergenerational Economic Mobility

America is known as the land of opportunity, but our children are not destined to do better than us.

Bryan A. Stuart

Economic Advisor and Economist
FEDERAL RESERVE BANK OF PHILADELPHIA

The views expressed in this article are not necessarily those of the Federal Reserve.

According to “the American Dream,” if we work hard enough and play by the rules, we’ll improve our situation and do better than our parents. But the data show that this is not equally true for all Americans. This is a concern for anyone who cares about the economy, because intergenerational economic mobility—defined as the relationship between children’s and parents’ economic outcomes—shapes the economy’s overall

productive capacity.¹ Newly available data have generated novel insights into the nature of economic mobility, and in this article I use that data to describe the key patterns and determinants of mobility in the U.S. Understanding economic mobility also helps us assess shifts in the economy that have occurred in recent decades and evaluate the long-run consequences of policies.

Key Patterns of Intergenerational Mobility

Thanks to the recent availability of tax data that contain high-quality information on parent-child linkages, income, and place of residence, we can now identify some of the key patterns in intergenerational mobility.

First, the share of children who earn more income than their parents did at the same age has decreased over time (Figure 1).² Over 90 percent of children born in 1940 earned more income than their parents. However, only 50 percent of the children born in 1980 earned more than their parents. Two factors explain this decline: the slowdown in income growth after 1970, and the fact that this slowdown was most pronounced at the lower and middle sections of the income distribution.

Second, a child's rank in the nationwide household income distribution is related to their parents' rank, but these variables do not simply move one-for-one with each other. This is made clear when comparing the rank of individuals born in the same year to their parents' rank.³ Specifically, there is considerable upward mobility for children born to parents with lower incomes. For example, children born to the poorest parents—in the 1st percentile of the income distribution—rise on average to the 31st percentile. There is also considerable downward mobility for children born to parents with higher incomes. Children born to the richest parents—in the 100th percentile—on average fall to the 73rd percentile. When averaging over all parents and children in the data, each 1 percentile increase in parents' income rank is associated with a 0.37 percentile increase in children's income rank. This relationship lies between the benchmarks of perfect mobility—where a child's income rank would be unrelated to their parents' income rank—and no mobility—where a child's income rank would equal their parents' rank.

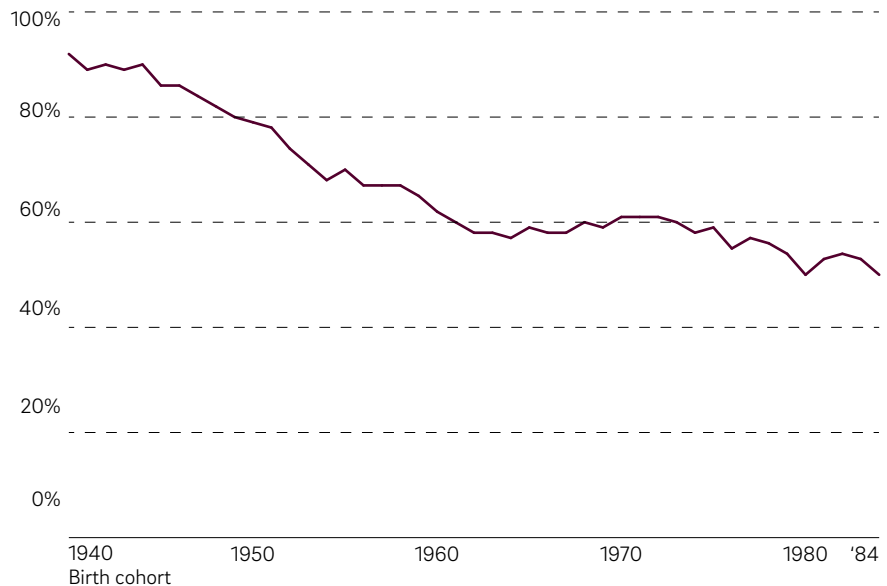
This relationship can also be used to gauge convergence across multiple generations. For example, parents in the 25th percentile of the income distribution on average have a child who rises to the 41st percentile, and parents in the 41st percentile of the income distribution on average have a child who rises to the 47th percentile, which implies that the grandchild of the 25th percentile earner

FIGURE 1

A Shrinking Share of Americans Earn More Than Their Parents

This is because sluggish income growth has been most pronounced for lower- and middle-income households.

Share of children who grew up to earn more than their parents did, 1940–1984



Data Source: Chetty, Grusky, Hell, et al. (2017).

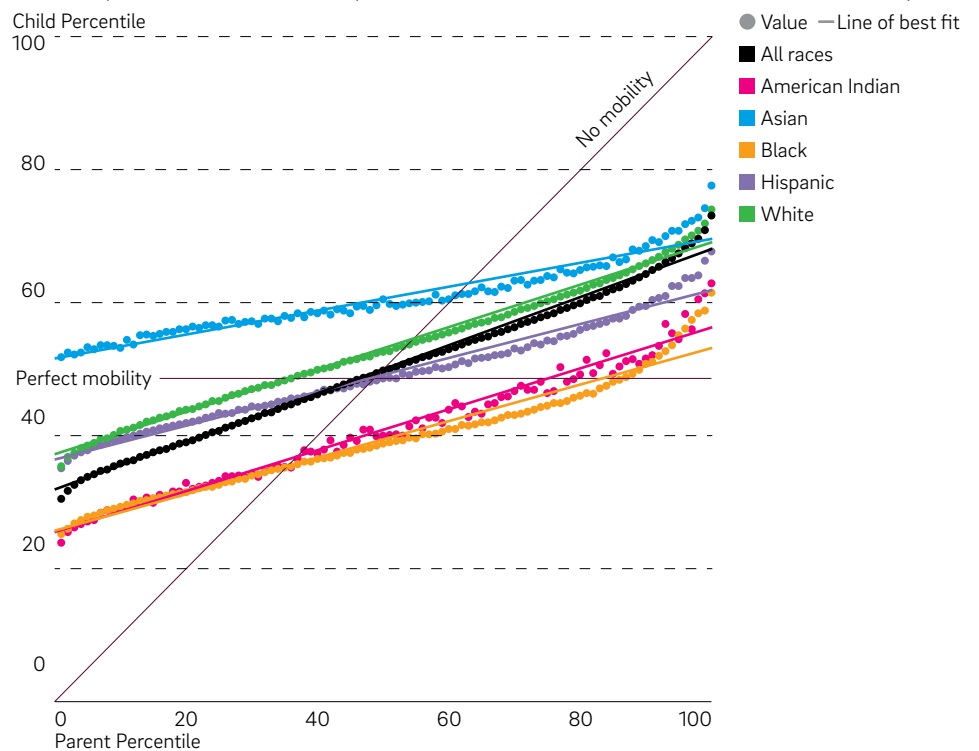
Note: Calculations based on inflation-adjusted, pre-tax household (including spouse's) income at age 30.

FIGURE 2

A Child's Income Is Related to Their Parents' Income

However, some races experience more intergenerational mobility than others.

Relationship between a child's and their parents' rank in the nationwide household income distribution, by race



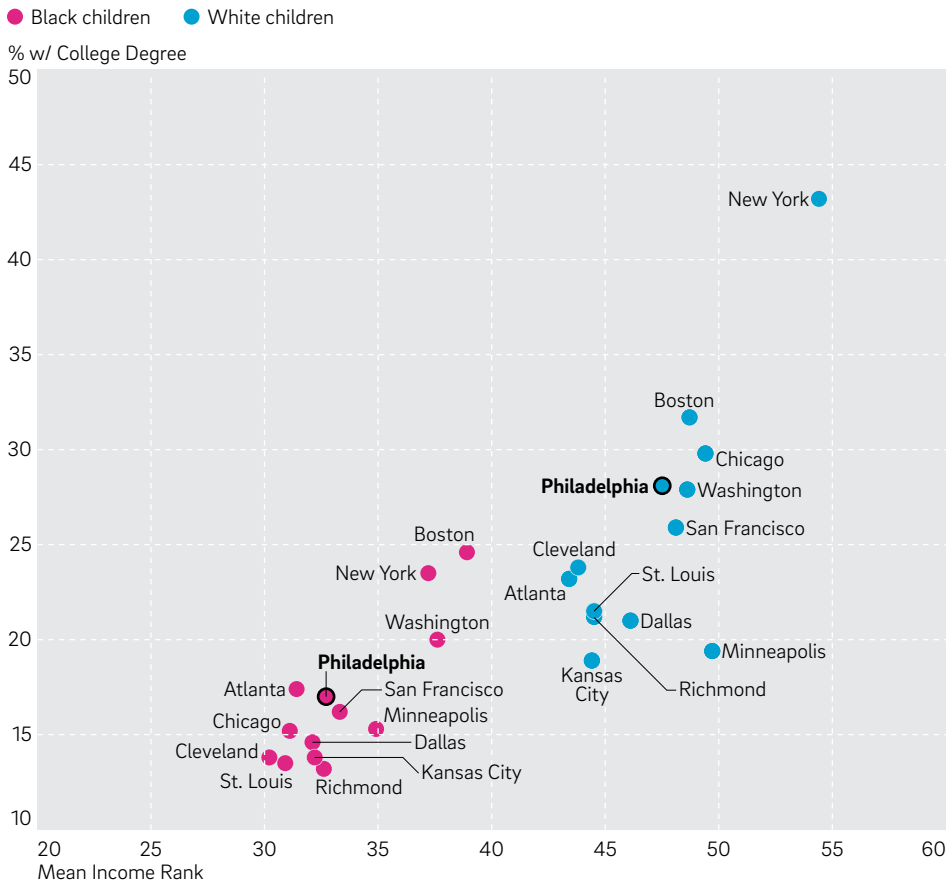
Data Source: Chetty, Friedman, Hendren, et al. (2020).

Note: Calculations based on inflation-adjusted, pretax household (including spouse's) income.

FIGURE 3

Economic Mobility Varies Across Areas

But White children experience more upward mobility and are more likely to get a degree. Mean income rank of children born to parents at the 25th percentile of the income distribution and the percentage of those children with a college degree, by commuting zone that hosts a Federal Reserve System bank or the Board of Governors



Source: Chetty, Friedman, Hendren, et al. (2020).

will rise to near the middle of the income distribution. This represents fairly rapid convergence in economic outcomes across two generations.

Third, patterns of economic mobility differ significantly by race and ethnicity (Figure 2).⁴ Among children born to parents with the same income rank, the income ranks of American Indian and Black children do not rise as much as the ranks of White and Asian children. The rate for Hispanic children is in the middle. This inequality in mobility by race and ethnicity is particularly striking because it compares children born in the same year to parents of the same income rank. These findings suggest that the lower income levels of American Indian and Black individuals will likely persist

for as long as these differing rates of economic mobility persist. One striking additional finding is that the Black-White gap in economic mobility is driven entirely by differences between men, as Black and White women have similar rates of economic mobility conditional on their parents' income rank.

Fourth, economic mobility varies considerably across local areas (Figure 3). For example, Black children born to parents in the 25th percentile of the nationwide income distribution rise on average to the 39th percentile if they spend their childhood in the Boston commuting zone, but only to the 30th percentile if they grow up in the Cleveland commuting zone. Because each percentile of the income distribution translates to around \$1,000 in

annual household income, this 9-percentile gap amounts to a difference of around \$9,000 in annual income. This difference in income mobility is closely related to the difference in educational mobility, which is calculated here as the share of children born to parents in the 25th percentile of the income distribution who get a college degree. There is also considerable variation in White children's economic mobility across areas.

These findings point to remarkable variation in economic mobility by time, space, and race. But why does economic mobility vary in these ways? I address this question in the remainder of the article, starting with a discussion of a conceptual framework that describes the determinants of long-run economic outcomes.

Determinants of Economic Mobility

Researchers have long identified human capital as a key determinant of an individual's economic success. Human capital comprises factors valued in the labor market, such as knowledge, skills, attitudes, and health. Usually, the more human capital you have, the higher your wages. Of course, an individual's income depends on many other economic and social forces, such as how many hours they work, the presence of labor market institutions (such as unions and a minimum wage), and the extent of the discrimination they face.

Human capital depends on inputs received throughout childhood.⁵ One set of inputs is environmental: the characteristics of a child's family, peers, and neighborhood. Another set of inputs comprises material and time investments from both private and public sources, such as parents and schools. Environmental factors are closely related to these investments, but investments are easier to adjust. For example, it is easier for a parent to change how much time they spend reading to their child than the neighborhood in which they reside.

However, some parents and children face constraints on their ability to finance these investments. These constraints arise because the return on investment—higher human capital—cannot be pledged as collateral to a potential lender. This differs from other situations where it is

neither illegal nor unethical to sign away one's rights to an asset (such as a house or car). Given these borrowing constraints, low-income parents might not be able to invest as much in their children as they would like. (Children, of course, face even greater constraints on their ability to borrow.) Higher-income parents are less likely to be constrained by their available income or assets, which means that lower-income parents may invest less in their children's human capital simply because they face constraints on their credit.

Importantly, the return on these investments depends on environmental factors. For example, all else being equal, children might benefit more from advanced math classes if they live in a safer neighborhood. If higher-income parents provide their children with an environment more conducive to human capital development, and if they respond to this better environment by investing more in their children, then they reinforce the positive relationship between their income and human capital investments.

These insights help us understand why some children have less economic mobility than other children. First, children of lower-income parents could receive a smaller investment in human capital (perhaps because of credit constraints). Second, exposure to worse environmental factors could undermine the human capital investments they do receive, which could explain why the economic outcomes of American Indian, Black, and Hispanic children are worse than for White children, even when their parents all earn the same income.⁶

To gather further insights into the determinants of economic mobility, I summarize some lessons gleaned from empirical papers about the consequences of specific factors and policies.

Evidence of the Determinants

During the last 10 years, researchers have made considerable progress in documenting how long-run economic outcomes depend on early-life conditions. A major catalyst of research in the U.S. has been the ability to link data on outcomes in adulthood with detailed geographic information on where children were born. I briefly summarize some of the key findings of the researchers who have used this data to study economic outcomes in the U.S.⁷

A large body of evidence indicates that negative environmental factors lead to long-run reductions in earnings, employment, and education. The specific environmental factors that are harmful for a child's economic outcomes include maternal malnutrition, stress, and disease while individuals are in utero; exposure to air pollution and lead; domestic violence in the families of elementary school classmates; and living in high-poverty neighborhoods.⁸ More generally, moving to counties or commuting zones where permanent residents have worse long-run outcomes leads to a decline in children's outcomes.⁹

In a recent Federal Reserve Bank of Philadelphia working paper, my coauthors and I focus on how metropolitan-area racial segregation affects economic mobility.¹⁰ Using variation in racial

segregation driven by the 19th century placement of railroads within cities, we find that segregation lowers the economic mobility of Black children from across the parental income distribution. We also find that segregation lowers the economic mobility of White children whose parents have a lower income. These negative impacts appear for income, incarceration, and teen births. Moreover, segregation lowers the test scores for grades 3 through 8 of both Black and White children, which suggests that decreases in human capital attainment during childhood contribute to the decline in long-run outcomes. Clearly, racial segregation is an environmental factor that is difficult for individual families to mitigate.

Evidence also indicates that investments during childhood can generate long-run increases in earnings, employment, and education. There is evidence of positive impacts from higher public-school spending via school finance reforms, Head Start preschool for disadvantaged children, Medicaid health insurance coverage during childhood, and food stamps.¹¹ One particularly intriguing finding is that publicly funded investments in the education and health of children from low-income families often pay for themselves in the form of higher tax revenue and lower government spending when those children become adults.¹² There is also research on policies and conditions that likely affect both environmental conditions and investments. For example, studies point to the positive impacts of the Earned Income Tax Credit, which increases the income of working parents, and stronger

Investments during childhood can generate long-run increases in earnings, employment, and education.

local labor market conditions, which can affect parents and communities.¹³ Beyond these large-scale policies, can anything else be done to improve children's outcomes? Yes: When both parents invest their time in their children, it has been shown, they increase their children's human capital attainment.¹⁴

Conclusion

Although children of higher-income parents have better economic outcomes on average in the U.S., there is substantial economic mobility. However, there is also inequality in economic mobility, with American Indian and Black children tending to obtain worse economic outcomes than children from other races who have parents at the same income level. Public investments in lower-income children have the potential to not only improve outcomes for those children but also benefit government budgets and the economy in general. Identifying how to effectively increase economic mobility will remain a key priority for researchers and policymakers for years, if not decades, to come. ■

Notes

- 1** For example, see Bernanke (2007), Yellen (2014), Harker (2017), and Powell (2019).
- 2** See Chetty, Grusky, Hell, et al. (2017). The authors' main results are for inflation-adjusted, pretax household income (which includes a spouse's income, if applicable) at age 30. Their conclusions are similar when examining individual income or adjusting for inflation in different ways.
- 3** See Chetty, Friedman, Hendren, et al. (2020).
- 4** See Chetty, Hendren, Jones, and Porter (2020).
- 5** See Becker and Tomes (1979, 1986), Cunha and Heckman (2007), and Mogstad and Torsvik (2022).
- 6** Of course, there are many other explanations, including racial and ethnic wealth gaps and discrimination at various stages of the lifecycle. Chetty, Hendren, Jones, and Porter (2020) discuss many of these issues in the context of the Black–White mobility gap.
- 7** Because these researchers have focused on the long-run consequences of events, by necessity they study events that happened long ago.
- 8** See Chetty, Hendren, and Katz (2016), Isen, Rossin-Slater, and Walker (2017), Almond, Currie, and Duque (2018), Billings and Schnepel (2018), and Carrell, Hoekstra, and Kuka (2018).
- 9** See Chetty and Hendren (2018).
- 10** See Chyn, Haggag, and Stuart (2023).
- 11** See Jackson, Johnson, and Persico (2016), Miller and Wherry (2019), Bailey et al. (2020), Bailey, Sun, and Timpe (2021), Goodman-Bacon (2021), and Biasi (2023).
- 12** See Hendren and Sprung-Keyser (2020).
- 13** See Bastian and Micheltmore (2018) and Stuart (2022).
- 14** See Del Boca, Flinn, and Wiswall (2014).

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The Economic Impact of the Opioid Epidemic

Drug abuse doesn't have just a human cost. There's also an economic cost.

Wenli Li

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The views expressed in this article are not necessarily those of the Federal Reserve.

Although the recent COVID-19 pandemic was severe, with a death toll of 1.2 million, the opioid epidemic that began in the late 1990s remains the longest ongoing health crisis in the U.S. Between 1999 and 2020, more than 564,000 people died from opioid overdoses, surpassing total deaths from auto accidents during the same period (Figure 1). In 2017 alone, 2.1 million people were diagnosed with opioid-related disorder.¹ Even more worryingly, the death rate from opioid overdoses skyrocketed after 2012.

There is growing evidence that the opioid epidemic has harmed many aspects of the real economy, including the labor market, consumer finance, and municipal finance. According to analyses from the Council of Economic Advisers' 2019 report,² the annual (nominal) economic cost of the opioid epidemic, including the cost of lives lost, is estimated at about \$700 billion (roughly 3.4 percent of GDP) in 2018 alone, and over \$2.5 trillion from 2015 to 2018.

See *Isolating the Causes.* →

Federal, state, and local governments have implemented regulations to tackle the opioid crisis by curbing both their supply and their demand. Prior studies have mostly focused on state and local laws. Unfortunately, these studies have found that regulations have had limited success in reducing either the death rate or the associated economic harm.

In this article, we review the history of the opioid crisis in the U.S., its economic impact, and the many government policies designed to contain the epidemic.

FIGURE 1
COVID-19 Was More Deadly, but the Opioid Epidemic Is the Bigger Ongoing Health Crisis

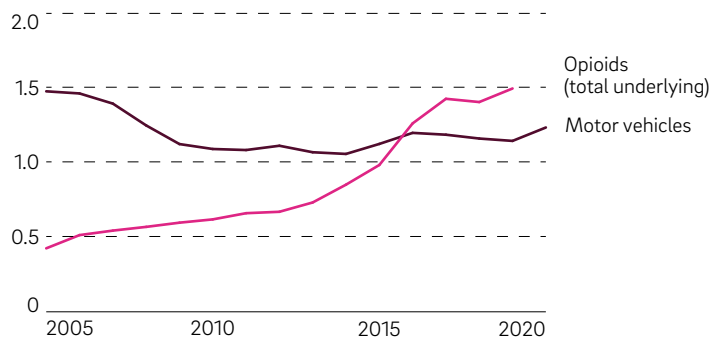
Economic Cost
 including lives lost

3.4%
 of GDP in 2018

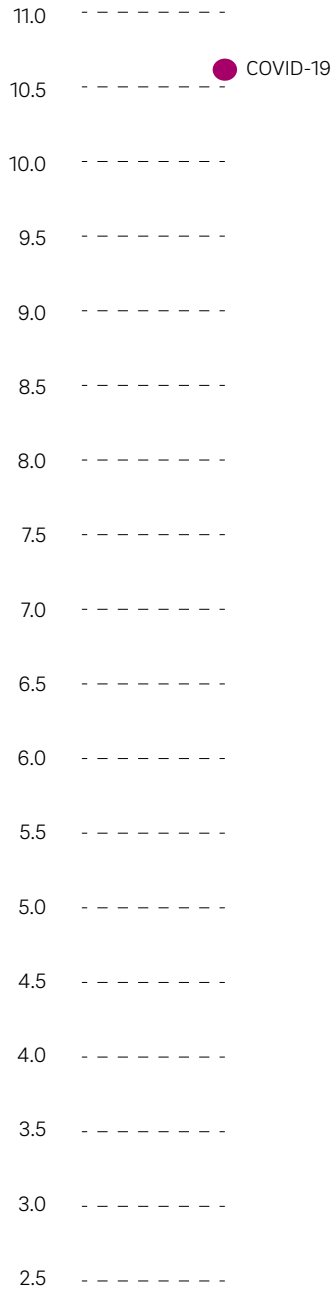
\$2.5+
 trillions, 2015–2018

Data Source: *Economic Report of the President* (March 2019).

Death Rates per 10k Population



Data Source: Centers for Disease Control and Prevention, National Center for Health Statistics, Mortality.



Isolating the Causes

Isolating the causality effects of opioid abuse on the real economy is a challenge because the opioid crisis may be an effect rather than a cause of local adverse economic conditions. Researchers address this challenge by relying on instruments that capture supply-side factors, given that prescription opioids are involved in at least 40 percent of all opioid overdoses in the country. Moreover, the majority of illegitimate-drug users start on their road to addiction by taking opioids prescribed by their physician, even if many progress to illicit opioids.

The instruments used by researchers include the intensity of local opioid distribution channels (for example, the per capita morphine milligram equivalent [MME] of strong types of opioids distributed by retail pharmacies); marketing efforts by the pharmaceutical industry that target physicians, such as the number (per county and per year) of physicians being marketed opioids; and Purdue Pharma's heterogeneous marketing efforts across different geographies of reformulated OxyContin in the first wave of the crisis, as proxied by growth in the distribution of OxyContin.

A Brief History of the Opioid Epidemic

The ongoing opioid epidemic in the U.S. has occurred in three waves. It started with technological innovations and aggressive marketing practices, followed by a burst of illegal activities in the second and third waves (Figure 2).

The first wave began with Purdue Pharma’s introduction of OxyContin in 1996 and ended in 2010. It coincided with a massive increase in the use of prescribed opioids and limited regulation of prescriptions.

OxyContin is a painkiller designed to be released slowly into the body so that it provides patients longer relief from pain with less of the potential for addiction. Between 1997 and 2002, Purdue Pharma increased its marketing and promotion budget for OxyContin by almost 800 percent, under the marketing slogan “The One to Start With and the One to Stay With.” Physicians who cared about treating pain-impaired patients were persuaded by this highly effective marketing campaign that the new opioids were safer than older ones.

But the benefits were too good to be true. Pain rebounded sooner and stronger than expected. Patients’ drug tolerance built up, which led to opioid abuse. Some people began crushing the pills and ingesting the medication all at once to get around the medication’s slow time release. By 2004, OxyContin had become the opioid most associated with addiction.³

The second wave of the opioid crisis dates from 2010 to 2013 and was characterized by a rise in heroin use and associated deaths. Two forces triggered the second wave. First, a reformulation of OxyContin in August 2010 made the drug crush-resistant and harder to snort or inject. Unfortunately, addiction is hard to stop once it gets started. This reformulation compelled many OxyContin addicts to switch to heroin, which they could more

easily snort or inject. Second, government policies restricted the supply of opioid prescriptions. A more limited supply drove up prices and simultaneously made it harder for addicts to access OxyContin. Heroin became relatively cheaper and easier to access, prompting many OxyContin addicts to switch to heroin.⁴

The third and current wave started in 2013, when deaths related to the use of fentanyl surged. (Fentanyl is more potent than heroin but cheaper to produce and transport.)⁵

Earlier opioid deaths occurred mostly among White, less-educated, prime-age males, as documented by researchers who argue that economic misfortune played an important role in the epidemic.⁶ This view, however, has been challenged, especially because the crisis has grown to affect an increasingly broad spectrum of the population, as can be seen when we chart the opioid-related death rate of each demographic group relative to their respective population (Figure 3).

Starting with the third wave in 2014, opioid-related death rates increased disproportionately among Black Americans, whose death rate has ranked first among all races in the last several years; among prime-age male workers, particularly those between ages 25 and 44; and among people with no more than a high school education.

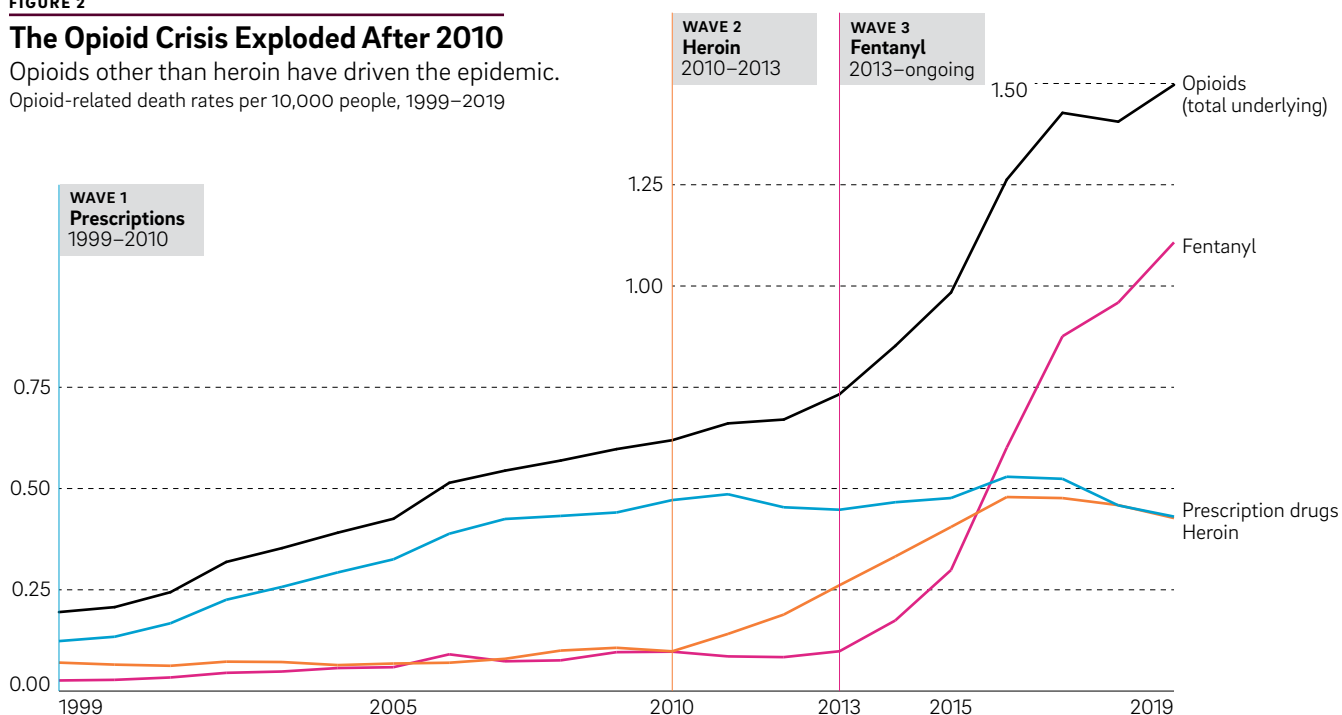
Researchers have concluded that changes in demand-side factors alone—including physical pain, depression, despair, and social isolation—explain only a small fraction of the increase in opioid use and deaths. Moreover, there doesn’t appear to be a substantial link between local economic downturns and rising working-age mortality from drug overdoses, opioids or otherwise.⁷ Instead, researchers have identified supply-side factors as the primary explanation for the recent opioid epidemic.

FIGURE 2

The Opioid Crisis Exploded After 2010

Opioids other than heroin have driven the epidemic.

Opioid-related death rates per 10,000 people, 1999–2019



Data Source: Centers for Disease Control and Prevention, National Center for Health Statistics, Mortality.

The Opioid Epidemic's Effect on the Real Economy

The medical profession has long documented that drug addiction often leads to unsound decisions due to “reinforcer pathology,” which increases an individual’s overvaluation of short-term rewards and undervaluation of long-term negative consequences. (Other causes of unsound decisions include impulsivity, nonconformity to rules, and cognitive issues.)⁸ These unsound decisions in turn render addicts less employable and lead to financial difficulties. Indeed, researchers have identified the detrimental effects of the opioid crisis on many aspects of the real economy, such as the labor market, the housing market, consumer finance, and municipal finance.

Researchers have found that the opioid epidemic has particularly harmed the labor market and firm production. For the labor market, workers who reported misuse of prescription drugs, including opioids, were more likely to report workday absenteeism and more days of absenteeism than workers who didn’t report prescription drug misuse.⁹ And counties in which more per capita opioid pain medication had been prescribed had lower labor force participation rates, lower employment-to-population ratios, higher disability insurance claiming rates, and higher unemployment rates.¹⁰

Meanwhile, firm growth is negatively affected by exposure to opioid-affected areas, because the eroding labor market conditions force firms to invest more in technology and to substitute capital for relatively scarce labor.¹¹ There are also negative impacts on small-firm formation and survival.¹² And opioid use reduces net firm entry and results in a shift in industrial composition due to labor supply issues in affected areas, driving long-term stagnation and fiscal difficulties.¹³

Researchers have also found that the opioid epidemic adversely affected consumer finance. Using data from a U.S. lender, one researcher documented an increase in consumer defaults in subprime auto loans due to local-market opioid abuse.¹⁴ Other researchers, using a nationally representative data set that covers both subprime and prime borrowers as well as a wide range of credit products, revealed unfavorable credit consequences for consumers living in—and for banks operating in—highly exposed areas.¹⁵ Specifically, low-credit-score consumers in areas with greater exposure to the opioid crisis were more likely to default on their loan obligations, including credit card debt, auto loans, and first mortgages. Single-branch banks also experienced more credit card defaults and nonperforming loans when they operated in counties more exposed to opioid abuse. As a result, lenders contracted the credit supply for consumers in these areas by applying stricter credit terms and reducing credit offers, particularly to those with lower credit scores.

Researchers have also found that the opioid epidemic harmed municipal finance. For example, local opioid abuse negatively affects municipal bonds, which in turn impedes a municipality’s ability to provide necessary public services and infrastructure.¹⁶ Other researchers have identified lower housing values in areas more affected by the opioid epidemic, which have negative implications for local government finance.¹⁷ And the more opioids distributed by a dispensary, the lower the value of surrounding homes.¹⁸

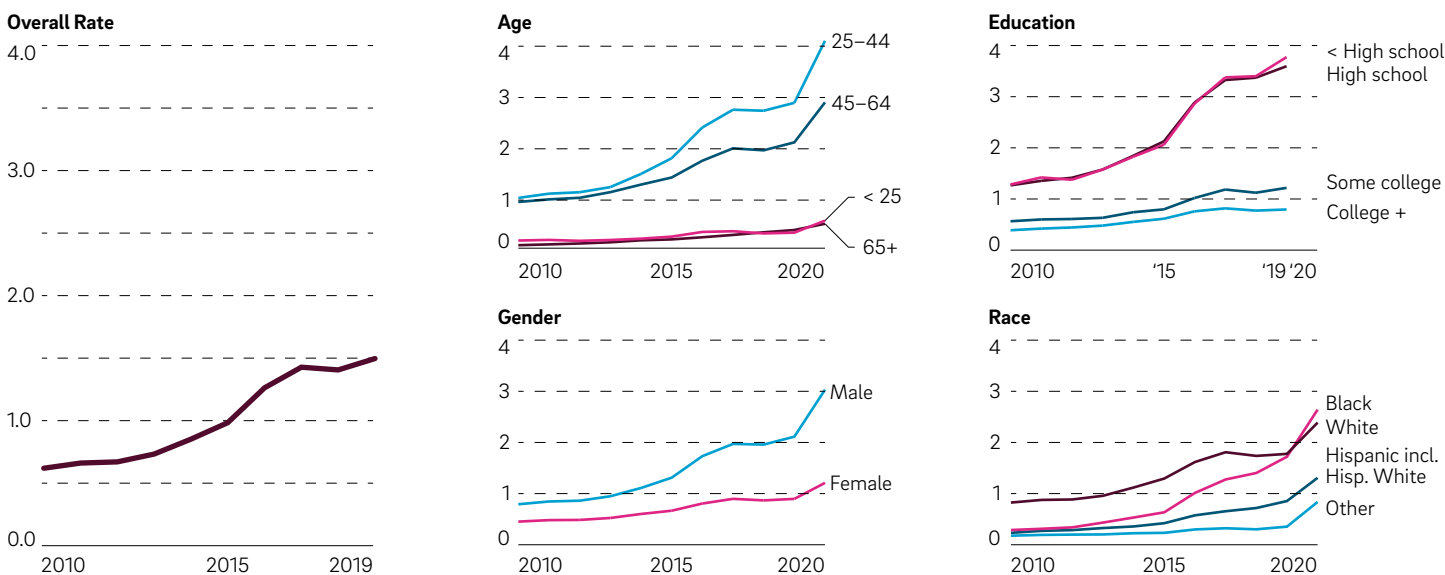
The Limits of the Law

Federal, state, and local policymakers have introduced many opioid-related laws and regulations to combat the opioid epidemic. In this article, we focus on state and local laws, as do

FIGURE 3

Opioid Death Rates Differ by Demographic Group

Opioid-related overall death rates per 10,000 people by consumer demographics, 2010–2020



Note: Rates are constructed relative to their respective population.

Data Source: Centers for Disease Control and Prevention, National Center for Health Statistics, Mortality.

most previous studies.¹⁹ Broadly speaking, we can divide these regulations into two groups: those that aim to restrict opioid supply and those that aim to restrict opioid demand. However, none of these laws have been very successful at curbing opioid use and abuse.

On the supply side, some states limit opioid prescriptions to four-, five-, or seven-day supplies when used to treat acute or postoperative pain for first-time users. As of 2018, 32 states also limited the number of prescriptions or the overall quantity of opioids that physicians may prescribe to a patient.

To varying degrees, states have also implemented a prescription drug monitoring program (PDMP), which uses an electronic database to track controlled-substance prescriptions within that state. PDMPs provide health authorities timely information about prescribing and patient behaviors that contribute to the epidemic; these data facilitate a nimble and targeted response. Some states mandate the use of PDMPs by prescribers; others make it voluntary. As noted earlier, the opioid crisis began when some doctors overprescribed opioids, sometimes illegally, so the information collected is also used by licensing boards to identify doctors, dentists, and pharmacists who may be inappropriately prescribing or dispensing these highly abusable drugs.

Additionally, states with triplicate prescription laws require that physicians write prescriptions on special triplicate forms for all Schedule II drugs, including opioids.²⁰ In triplicate prescribing, the physician keeps one copy of the prescription for five years and sends two copies with the patient to the pharmacist. The pharmacist keeps one copy and forwards the third copy to a specified state agency. The state agency uses these prescriptions to track the physician's prescribing practices and the patient's use of controlled substances.²¹

On the demand side, states have implemented access laws for naloxone, which reverses an opioid overdose. The level of naloxone access varies by state. The most generous laws include a standing order that allows any resident to obtain the drug at a local pharmacy with no justification. The less-generous third-party prescription laws, by comparison, allow a resident who is not at risk of overdose to purchase naloxone for use on someone else.²² As of August 2020, all 50 states and the District of Columbia have some form of a naloxone access law.

Good Samaritan laws offer legal protection to people who give reasonable assistance to those who are, or whom they believe to be, injured, ill, in peril, or otherwise incapacitated. Such laws vary from state to state. Although they don't limit opioid addiction, they may reduce fatal opioid overdoses by allowing people to help an addict without fearing legal consequences related to drug use and possession.

Finally, in 37 states and the District of Columbia, medical marijuana permitting laws legalize the medical use of cannabis with a doctor's recommendation. Recreational use of cannabis has


been legalized in 21 states and the District of Columbia. The legalization of marijuana use, either medically or recreationally, may have spillover effects on opioid usage. Cannabis could offer an alternative to opioids for treating chronic pain and therefore reduce opioid overdoses and deaths. Additionally, cannabis might help people with opioid use disorder curb their addiction.

Evidence of the effectiveness of these laws, whether they target supply or demand, has been mixed. Two researchers found that PDMPs reduce prescription rates but do not reduce opioid deaths or improve socioeconomic outcomes.²³ However, other researchers have found that a state's implementation of a PDMP reduces opioid deaths and partially reverses some negative effects on municipal finance in that state.²⁴ Two other researchers found evidence of increased opioid abuse after easier access to naloxone. This is likely due to increased risk-taking by addicts, given that they know there is an antidote in place to save their lives.²⁵

When the three authors of this article, along with one other researcher, examined six state-level opioid-related laws, they found that all laws except the naloxone laws help reduce opioid prescription rates, with the strongest effects in states with triplicate prescription, PDMP, and medical marijuana permitting laws.²⁶ However, the effects on opioid deaths were more complicated. These researchers also found that, in terms of credit supply, a few of the laws—specifically, laws that limit opioid prescriptions, the mandatory PDMPs, and triplicate prescription laws—tend to improve consumer access to credit, while others—specifically, the naloxone, Good Samaritan, and medical marijuana permitting laws—appear to help less or even harm consumer access to credit. These laws may even intensify the opioid crisis.

To understand the impact or lack of impact of these antiopioid regulations, one researcher built a model of how consumers who use opioids for nonmedical reasons choose between legitimate prescriptions and illicitly manufactured opioids.²⁷ He demonstrated that the price gap between prescribed opioids and illicitly manufactured opioids is a critical determinant of whether the regulations reduce or increase the use of opioids and by how much. As a result, policies aimed at reducing prescription opioid consumption can lead to increased mortality in the short run due to widespread substitution with illicit opioids.

Conclusion

The opioid crisis has multiple and complex dimensions, as its evolution over the last few decades has demonstrated. Despite this complexity, we can safely conclude that (1) the crisis has negative economic outcomes; (2) the crisis has become less driven by opioid prescriptions, thanks to the many state laws and regulations that target the supply and prescription of opioids; and (3) designing effective policies that curb demand for opioids remains a challenge. 

Notes

- 1** See, among others, Quinones (2015), the Centers for Disease Control and Prevention (2021), and the Centers for Disease Control and Prevention (2022).
- 2** Economic Report of the President (2019).
- 3** See Alpert, Evans, Lieber, and Powell (2022) and Cutler and Glaeser (2021), among others, for more details.
- 4** National Institute on Drug Abuse (2018) and Unick, Rosenblum, Mars, and Ciccarone (2014).
- 5** See the review article by Maclean, Mallatt, Ruhm, and Simon (2020), the article by Cutler and Glaeser (2021), and the papers cited within.
- 6** See Case and Deaton (2015) and Krueger (2017).
- 7** See Ruhm (2019), Cutler and Glaeser (2021), and McGranahan and Parker (2021).
- 8** See Bickel, Athamneh, Snider, et al. (2020).
- 9** See Van Hasselt, Keyes, Bray, and Miller (2015).
- 10** See Krueger (2017), Harris, Kessler, Murray, and Glenn (2020), Park and Powell (2021), Aliprantis, Fee, and Schweitzer (2022), and Beheshti (forthcoming).
- 11** See Ouimet, Simintzi, and Ye (2020).
- 12** See Rietveld and Patel (2021) and Sumell (2020).
- 13** See Langford and Feldman (2021).
- 14** See Jansen (2019).
- 15** See Agarwal, Li, Roman, and Sorokina (2022).
- 16** See Cornaggia, Hund, Nguyen, and Ye (2021).
- 17** See Custodio, Cvijanovic, and Wiedemann (2021).
- 18** See D'Lima and Thibodeau (2022).
- 19** See Congressional Budget Office (2022) for a summary of federal interventions.
- 20** Drugs are classified as Schedule II drugs if they are determined to have a high potential for misuse, dependence, and addiction. Schedule II drugs have some accepted medical uses, although the uses vary depending on the type of drug.
- 21** With some exceptions, refills are not permitted for medications prescribed under this system.

22 Because naloxone remains a prescription drug as categorized by the U.S. Food and Drug Administration, standing orders and third-party prescriptions are enabled only when a state's surgeon general writes a prescription for all residents of that state.

23 See Kaestner and Engy (2019).

24 See Cornaggia, Hund, Nguyen, and Ye (2021).

25 See Doleac and Mukherjee (2019).

26 See Agarwal, Li, Noman, and Sorokina (2022).

27 See Mulligan (2022).

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Not All Rush Hours Are the Same

Why are commute times for Black workers longer than those of White workers, especially in Philadelphia?

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Access to employment is a key determinant of labor supply, wages, and free time. Workers with access to job-dense labor markets are more likely to find and keep jobs that are a good fit, to earn more, and to spend less time commuting when working. Because access to jobs is so important, inequality in commuting outcomes may help explain overall inequality in welfare.

According to research co-conducted by one of the authors of this article, nationally there are racial inequalities in commuting, and these inequalities are concentrated in large, segregated cities with mass transit systems.¹ Greater Philadelphia is one such city: It is the nation's seventh-largest metropolitan area, one of the nation's most segregated urban areas, and has many transit users.² And indeed, despite some convergence in commute times since 1980, Black commuters in Greater Philadelphia commuted 34 minutes more per week on average than White commuters as of 2019. In this article, we report the results of our research on racialized differences in commuting outcomes for Greater Philadelphia and explain the context and drivers that likely play a role in perpetuating these differences.

Framework and Data

Prior research tells us that the commute time for any individual is shaped by three factors: residential location, workplace, and travel speed. Home and work locations together determine the distance workers must travel, whereas speed dictates how long it takes to travel that distance.³

Unfortunately, few data sources report these factors in conjunction with race. We therefore combine several data sources that collectively tell us how each factor contributes to racial differences in commute times, and how these differences interact with other urban patterns. This is an important first step for designing policies that increase access.

To understand the overall difference in commute times by race and its evolution, we use data from the census (in 1980, 1990, and 2000) and the American Community Survey (from 2005 to 2019). This combined data set includes information on commute time and mode, demographics (including race), and many other characteristics of individual commuters. However, it provides only coarse residential location and very limited information about the place of work, so we use demographics (such as level of education and number of children)

See *Working from Home.*

and industry as rough proxies for home and work locations.⁴ We end our analysis in 2019 because the pandemic greatly altered commuting patterns, and workers may still be adjusting to new work-from-home arrangements.

To see commuters' locations more precisely, we turn to two other data sets. Brown University's Longitudinal Tract Database reports tract-level averages of demographics, as well as commute time and mode.⁵ We also use the Delaware Valley Regional Planning Commission's 2012–2013 Household Travel Survey for the Delaware Valley region, which provides detailed data on the locations and motivations for all trips (not just commutes) taken by a sample of about 20,000 households, along with details about each trip (specifically, time, distance, speed, mode, cost, and purpose).

Overall Differences and Trends

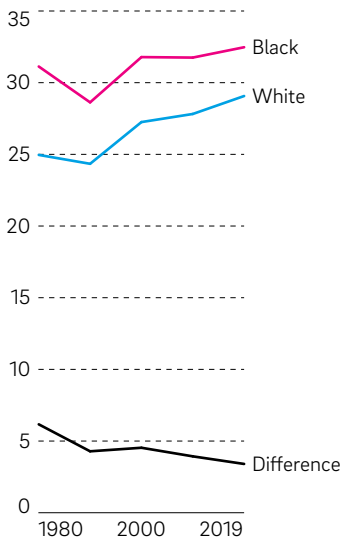
In 2019, the average one-way commute for a White commuter in Philadelphia was 29.1 minutes, versus 32.5 minutes for a Black commuter (Figure 1).⁶ This means that, over the course of a week, a Black worker spends on average 34 more minutes commuting than the typical White worker.

FIGURE 1

On Average, White Philadelphians Have a Shorter Commute

Over the course of a week, a typical Black worker spends 34 more minutes commuting from home to work.

Average commute time from home to work, in minutes and by race, Greater Philadelphia, 1980–2019



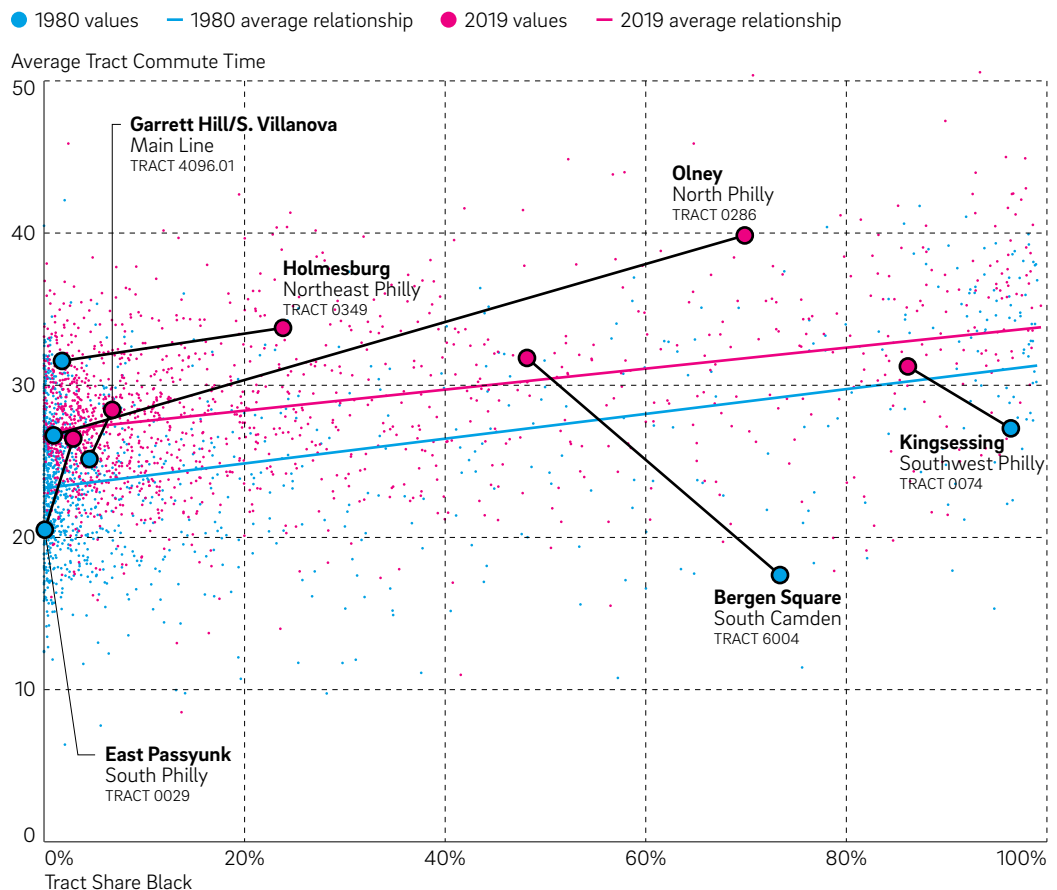
Data Sources: U.S. Census and American Community Survey.

Note: We use "2019" to refer to data combining all data from the 2012–2019 data set.

FIGURE 2

The Larger the Share of Black Residents, the Longer the Commute

This relationship has been relatively stable even as commutes have lengthened since 1980. Average commute time from home to work in minutes and percent of residents who are Black, by census tract, Greater Philadelphia, 1980 and 2019



Data Sources: U.S. Census, American Community Survey, and Longitudinal Change Database.

This difference, while substantial, has declined over the last 40 years. In 1980, the average commute for a White worker was 25.0 minutes, whereas it was 31.1 minutes for a Black commuter. This aggregates to about an additional hour spent commuting each week for Black workers in 1980.

These aggregate differences reflect spatial factors. Many of the neighborhoods with the longest average commutes are also home to substantial Black populations (Figure 2). This relationship holds on average: Longer average commute times from a neighborhood are associated with a higher proportion of Black residents in that neighborhood. The average commute for workers residing in a tract with no Black residents is seven to eight minutes shorter than for workers living in a tract with all Black residents. The data also show that commutes in 1980 were three to five minutes shorter on average than commutes in 2019, both for tracts with few Black residents and for tracts with many Black residents. This highlights the stability of the neighborhood-level relationship between race and commute time in Philadelphia.

Explaining These Differences

To find out why White commuters in Philadelphia have shorter commutes than Black commuters, we estimate a linear regression model of commute times, and we include many control variables to see if factors other than race can explain the overall differences.⁷ (Linear regression is a statistical technique that uses a line to estimate the value of an outcome—in this case, commute time—based on some characteristic—in this case, race; control variables are the other characteristics that may influence that relationship.) This technique decomposes the difference in commute times into two parts: One that can be explained by factors that we observe, and another that cannot be explained by these factors.

We classify our many control variables into four thematic categories based on how they connect to our framework.

The first category is county of residence, which directly corresponds to residential location.

The second category is commute mode, which is an important determinant of

travel speed: Walking is slower than transit or driving, and transit is often slower than driving.

The third category is personal and family characteristics (such as sex, age, level of education, household type, and number of children). These characteristics are likely to influence residential location (for example, households with children often prefer to live in different places than those without), but they can also influence workplace factors (for example, those with a college degree often work in different places than those with only a high school diploma) or speed of commute (households with children may drop them off at school while commuting, decreasing the speed of their commute).

The fourth category is job characteristics, including income, industry, and occupation. These characteristics are a proxy for factors that determine workplace location, as industries and occupations tend to concentrate together.

After we account (that is, control) for these factors, the additional commute time of Black workers falls from 16 percent to 11 percent in 2019. Put differently, all the factors that we observe together explain only a bit less than one-third of the total 16 percent difference in commute times. Among the factors that we observe, commute mode (which determines speed) is the most important, explaining nearly half of the total difference in 2019 (Figure 3). County of residence explains about one-fifth of the difference. Accounting for job factors and personal and family characteristics, however, actually decreases the difference. This means that, on average, Black workers hold jobs and have (nonrace) personal and family characteristics that are typically correlated with shorter commutes. This suggests that differences in where people live and how they get to work are what's most important for understanding commuting differences by race.

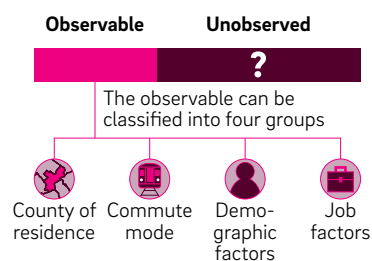
More than two-thirds of the difference in commute times is not explained by differences in mode, residential county, or the other factors we observe in our data. This unexplained difference is sometimes interpreted as a measure of discrimination. However, it may instead reflect differences in other, unobserved factors; compensation for other workplace

or residential attributes; or selection into employment. (Notably, we only observe commute times for people who are in the labor force and employed—that is, who select into employment. If a lack of access causes potential Black workers to be unable to find work, this could bias our results. However, one recent paper finds little evidence that selection drives differences in observed commute times.)⁸ Discrimination could also play an

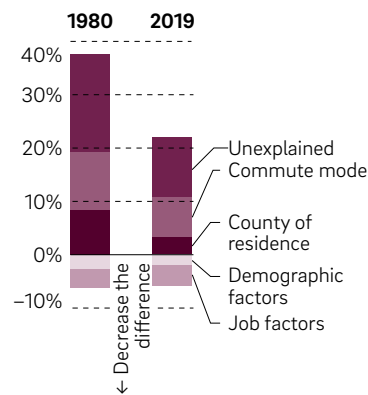
FIGURE 3

How We Analyze the Data

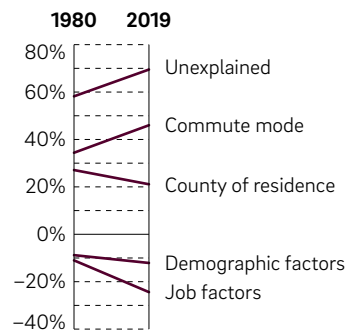
We can explain the differences through both observable and unobserved factors.



How do those groups of factors explain the differences in both 1980 and 2019?



And how has the influence of each factor changed over time as a share of each year's racialized difference?



Data Sources: U.S. Census and American Community Survey.

upstream role in determining a commuter’s observed characteristics (such as their industry or level of education).⁹ Regardless, our analysis describes how the racialization of different channels might create racialized differences in commuting outcomes, rather than saying precisely how much of this difference is directly due to discrimination.

How much has the influence of these factors changed since 1980? Residential county was more important in 1980, when it explained 27 percent of the (larger) difference in commute times. This likely reflects the higher level of residential segregation in 1980. All other factors were proportionately less important in 1980. However, all the observable characteristics together made a bigger impact in 1980, when they accounted for two-fifths of the total 31 percent longer commute time of Black workers. Nonetheless, three-fifths of the difference cannot be explained by these observed controls even in 1980. Other, unobserved variables must also contribute to the persistent, racialized differences in commute times.

We also report how much of the overall decline in Black workers’ longer commutes is explained by changes in these characteristics. County of residence explains about 34 percent of this partial convergence between commute times for White and Black workers, whereas transit mode explains only about 22 percent. The other observed characteristics do not contribute much to the decline, so unobserved factors are also behind a large part (46 percent) of the decline.

These results suggest that although residential location and commute mode are quite important, other factors collectively play an even larger role. One factor might be the spatial configuration of workplace locations with respect to residential locations. The combination of these two factors

determines the length of the commute, which cannot be studied using the above data.

To get directly at whether commute time differences are caused by differences in either distance commuted or speed, we turn to the Delaware Valley Regional Planning Commission’s 2012–2013 data. According to this data, Black commuters on average travel shorter distances but at a slower speed (Figure 4). If we ignore differences in travel mode, commutes by Black workers are 26 percent shorter in distance than those by White workers, but they are 43 percent slower. Accounting for travel mode makes these differences smaller, but not by much.¹⁰ So, although the distance traveled by Black workers between their residences and jobs is smaller, the slower speeds greatly increase total commute times. And this is not just for commutes—differences are even more pronounced among all trips.¹¹

These results highlight that speed is a first-order determinant of differences in commuting outcomes, and the slower average speed of Black commuters is not just a function of the mode of commute. This suggests that, even when we compare people who use the same mode, Black commuters are driving in places that have slower speeds on average, or are served by transit that provides less access or has slower service.

Where Differences Are Larger

Accounting for commute mode and income explains some of the partial convergence in commute times since 1980, but people of different races still have different experiences even if they use the same mode or have the same income. All the results so far differentiate people only by race and so may mask more diverse experiences.

FIGURE 4

Black Commuters on Average Travel Shorter Distances but at a Slower Speed

The slower speed greatly increases commute times for Black workers.

Average travel distance, time, and speed for all trips and work commutes, by race, Greater Philadelphia, 2012–2013

○ All-trips ● Commutes ● Black ● White

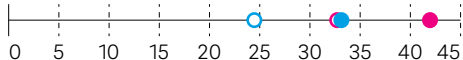
Average Travel Distance

Mean distance, miles



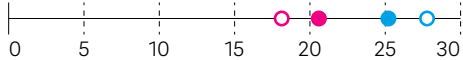
Average Travel Time

Mean time, minutes



Average Travel Speed

Mean speed, mph

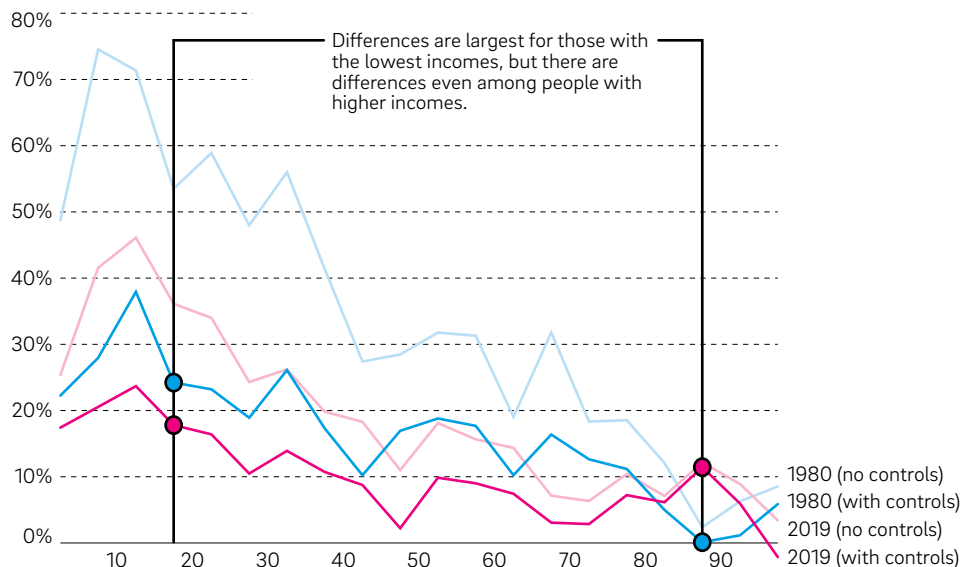


Data Source: Delaware Valley Regional Planning Commission’s 2012–2013 Household Travel Survey for the Delaware Valley Region.

FIGURE 5

Commute Times for Black and White Workers Are Most Different for Lower-Income Workers

This is true even after controlling for variables other than race. Racialized difference in commute times, with and without controls, by income centile, Greater Philadelphia, 1980 and 2019

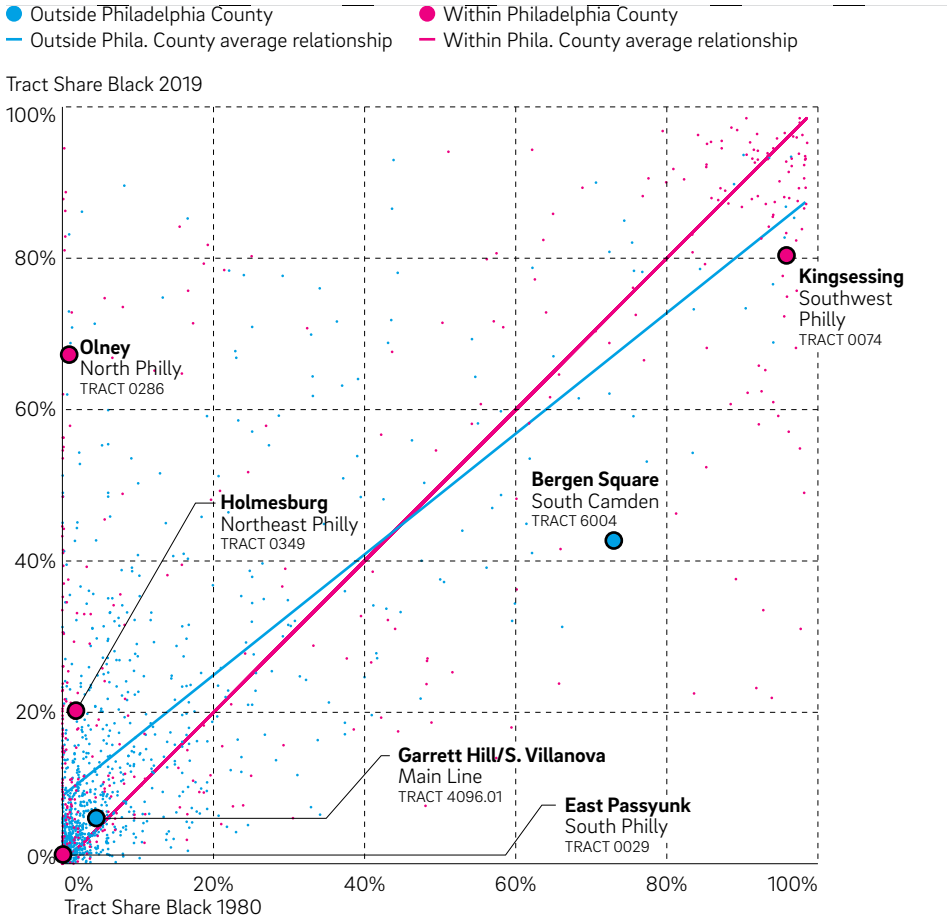


Data Sources: U.S. Census and American Community Survey.

FIGURE 7

Segregation Is Persistent

Segregation is higher in the City of Philadelphia than in the rest of the region. Relationship between a census tract's share of Black residents in 1980 and in 2019, Greater Philadelphia



Data Sources: u.s. Census and American Community Survey.

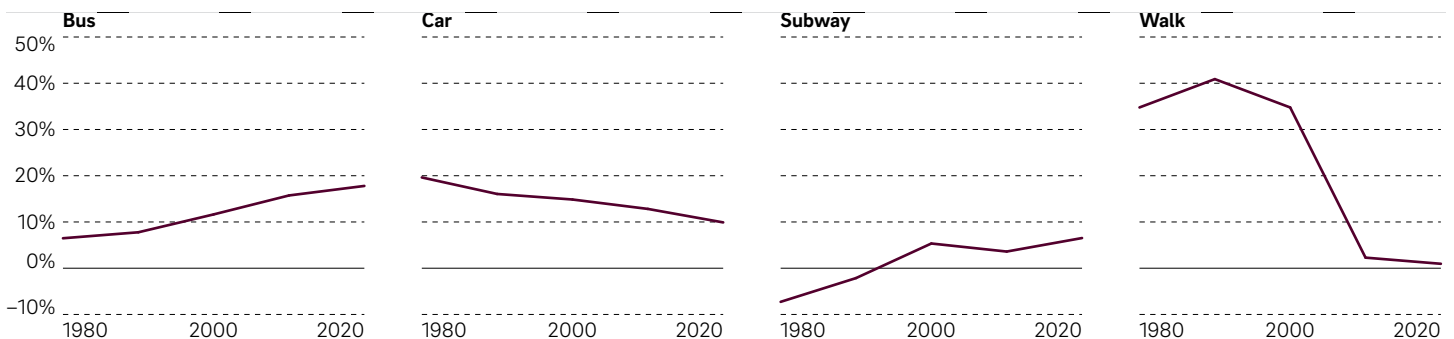
Commuter times for Black and White workers are most different among low-income workers (Figure 5). Among those with earnings in the bottom fifth of the income distribution in 2019, Black workers had commutes that were about 40 percent longer than White workers' commutes. Even after accounting for the observed characteristics described above, the lower-income Black workers' commutes were 20 percent longer than those of their White counterparts. And this reflects a substantial improvement since 1980, when the difference was 65 percent before accounting for observed characteristics, and 30 percent after. However, the differences were much smaller for higher-income workers in both 1980 and 2019.

As we saw earlier, transit mode is an important factor in determining commute time. The average commute time among car users was about 11 percent longer for Black drivers in 2019, falling from a difference of 20 percent in 1980 (Figure 6). However, commutes for Black bus and subway riders have been growing longer than the commutes for White bus and subway riders. This trend is worrying because it could represent reduced equity in transit services. On the other hand, there has been substantial convergence in commute times for both Black and White walkers.

FIGURE 6

Transit Mode Is an Important Factor in Determining Commute Time

Black transit riders have seen their commutes grow disproportionately longer. How much longer commutes are for Black workers compared to White workers, percent, by mode of transport, Greater Philadelphia, 1980–2020



Data Sources: u.s. Census and American Community Survey.

Philadelphia vs. the Nation

The racial difference in commute times in Greater Philadelphia as of 2019 is a bit larger than in the nation.¹² Black workers in the U.S. had commutes 5 percent longer than White workers on average, compared to an 11 percent difference in Greater Philadelphia (accounting for observed characteristics). Because the average commute time irrespective of race in Greater

Philadelphia is longer than in the nation, this difference magnifies a larger base, making the absolute difference in minutes even larger than in the U.S.

There has been less convergence in Black and White commute times in Philadelphia than in the U.S. The commute times of Black commuters and White commuters looked more similar in 1980, when the racial difference in commute times was 16 percent in Greater Philadelphia and 13 percent in the U.S. In part, the lower convergence in Philadelphia reflects less convergence in automobile usage by Black and White Philadelphians since 1980. But there is still a noticeable difference when we compare those taking the same commute mode or with similar incomes. In the U.S., the commute times for Black and White drivers have almost converged, with just a 3 percent difference, while in Greater Philadelphia the average commute time is still 10 percent longer for Black drivers than for White drivers. And in both Greater Philadelphia and the U.S., the longer commute times for Black transit riders have not decreased relative to White transit riders since 1980, and those commute times are, by some measures, increasing. As more people drive to work, the remaining population of transit users becomes increasingly low-income and minority.¹³ This helps explain why, in Greater Philadelphia, lower-income Black workers face longer commutes relative to lower-income White workers than in the U.S. as a whole.

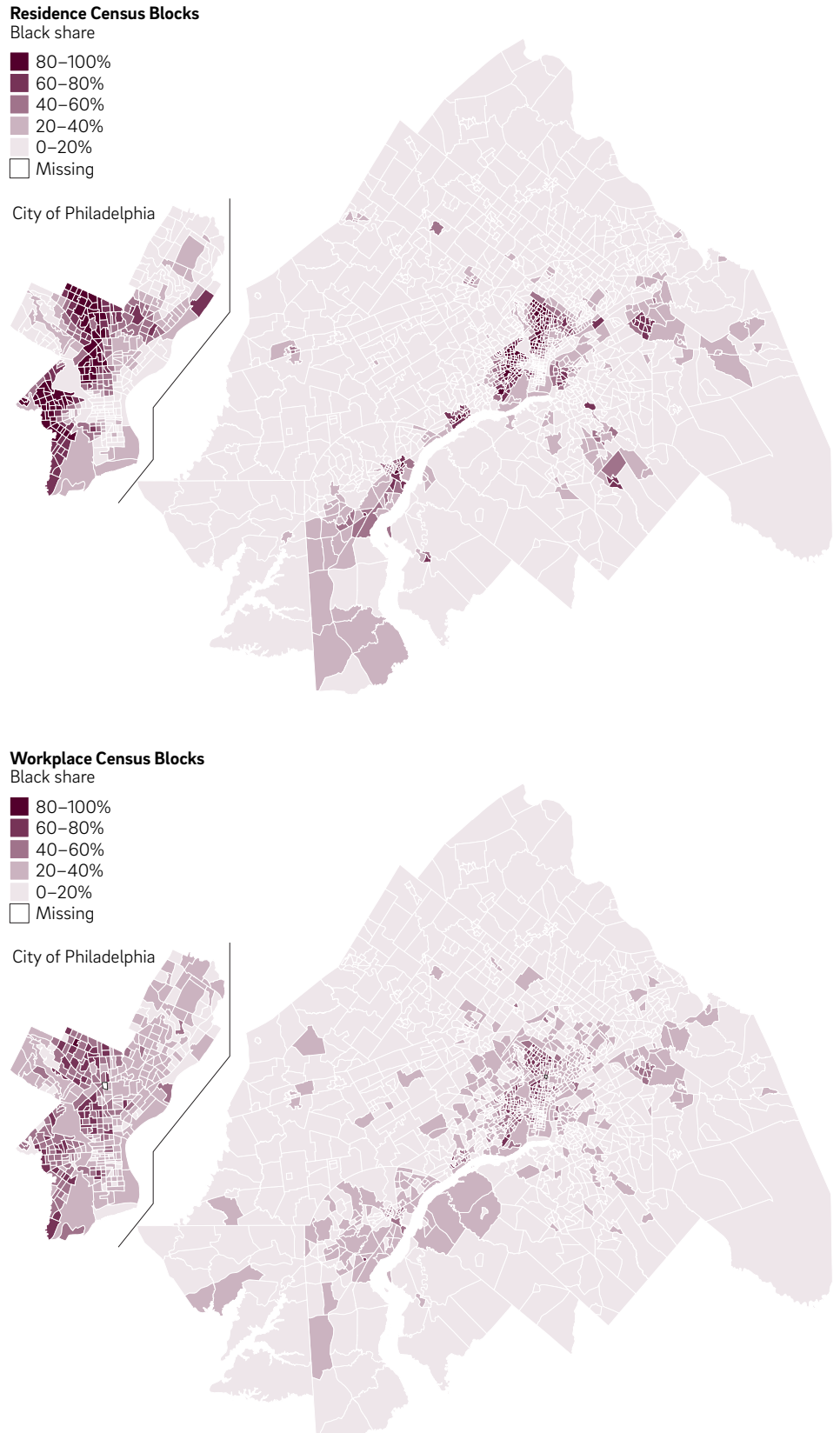
Why Differences Persist in Philadelphia and the Nation

In Philadelphia, three geographic trends influence where people live, where people work, and how fast they travel between the two. First, urban neighborhoods typically evolve quite slowly, so past segregation and discrimination can affect the present. Second, Greater Philadelphia has seen substantial suburbanization in both its residential population and its workplaces, but this has not impacted Black and White workers to the same extent. And third, Greater Philadelphia’s relatively extensive transit system plays an evergreen role in shaping the distribution of population in the region. We consider each of these trends, and how they interact, in detail.

FIGURE 8

Black Employment Is More Dispersed Than Black Residential Locations

This means that some Black workers must “reverse commute” to the suburbs for work. Share of Black residents and jobs held by Black workers, by census block, Greater Philadelphia, 2019



Data Sources: U.S. Census and American Community Survey.

Segregation persists in many U.S. cities despite the passage of the Fair Housing Act 55 years ago. This durable segregation produces barriers to equality in labor market outcomes and so likely relates closely to differences in commuting.¹⁴ Segregation is particularly persistent in Greater Philadelphia: For every additional 10 percent share of Black residents in a neighborhood in 1980, the additional share in 2019 was 8 percent (Figure 7).¹⁵ The data also show higher levels of segregation in the City of Philadelphia than in the rest of the region.¹⁶

Workplace locations, meanwhile, have suburbanized over the past 40 years. In 1980, 35 percent of Greater Philadelphia workers worked in the City of Philadelphia; in 2019, this figure was about 24 percent. And research indicates that job suburbanization in the U.S. generally harmed Black employment prospects because Black households are less likely to move to the suburbs.¹⁷ Compounding this issue, residential locations in Greater Philadelphia have also suburbanized. In 1950, roughly 66 percent of Greater Philadelphia’s population lived in the City of Philadelphia, but that share had fallen to 37 percent by 1980 and was at 28 percent as of 2020.¹⁸ As a result of these changes, Black workers today are relatively more likely to live in the city than White workers, whereas jobs are now relatively more likely to be found in the suburbs.

This wouldn’t be such an important issue if all urban Black workers could easily commute to jobs in the Philadelphia suburbs.¹⁹ But labor market accessibility for Black workers relative to White workers—a major predictor of convergence in commuting

outcomes—barely changed in Greater Philadelphia between 1990 and 2019.²⁰ Black employment locations are more dispersed than Black residential locations, indicating that some Black workers living within the City of Philadelphia have been able to access some suburbanizing jobs (Figure 8), but this requires the ability to “reverse commute” to the suburbs. This is more difficult for lower-income workers, who are less likely to own a car and thus must use Greater Philadelphia’s large legacy transit system, which itself has been the scene of historical racialization.

More generally, transit alters the spatial distribution of income in a city and has historically played a central role in the urbanization of poverty.²¹ If a faster mode of transportation (for example, cars) is principally available only to those with a higher income, lower-income households, which are more likely to be minority, will tend to locate in transit-accessible locations. Although Greater Philadelphia’s transit system permits many city and suburb dwellers to access jobs in the urban core, it was not designed to help lower-income households access more recently suburbanized jobs.

What’s more, transit spending and investment in Greater Philadelphia may itself perpetuate patterns of inequality. From 2007 to 2016, Regional Rail, which was designed to speed suburban access to the urban core, received 38 percent of capital outlays from the Southeastern Pennsylvania Transit Authority (SEPTA), despite supporting 11 percent of ridership (though this

See *Transit and Race in Philadelphia and the Nation.*

Working from Home

The importance of commuting is evolving in response to the work-from-home (WFH) movement induced by the COVID-19 pandemic. About one out of three full-time workdays are now done from home, a figure that has been stable for the last year.²⁹ Workers often elect to work from home because that way, they can spend significantly less time and money commuting. Unfortunately, this working arrangement is not an option for most American workers. Although more workers have been working from home since the pandemic, more than half of Americans do not have a job that can be done virtually.³⁰

Nonminority and more-advantaged workers are more likely to be able to work from home.³¹

Most of the jobs that cannot be done virtually are in manufacturing and services, fields in which Black and other minority workers are overrepresented. In December 2022 and January 2023, about 22 percent of Black households, as opposed to about 29 percent of White households, reported someone in the household working from home or teleworking at least one day per week.³²

Currently, a significantly higher proportion of Black workers rely solely on public transportation. For many metropolitan areas, the expansion in the number of workers moving away from daily commuting has been adverse for public transportation.³³ In most cities, daily ridership of public transit has not

reached prepandemic levels. Transit systems have been forced to close routes and implement less-frequent schedules during peak travel times. This has caused longer travel times and less efficient mobility for commuters, leaving those who do still use transit worse off. This differential exposure to WFH has the potential to lead to larger differences in commuting outcomes by race, particularly if WFH remains a prominent feature of the labor market.

spending was a substantial increase over the 1990s), whereas Philadelphia’s subway, which operates exclusively within the city, received 21 percent of capital outlays while supporting 28 percent of ridership.²² More recently, while SEPTA’s (recently canceled) light-rail extension to King of Prussia, PA, would have improved access to suburban jobs for city dwellers, SEPTA’s past prioritization of this project over urban projects (like extending its subway to the Philadelphia Navy Yard or providing mass transit service to Northeast Philadelphia with a Roosevelt Boulevard subway) suggests that the large racial difference in commute times among transit users could increase in the future.²³ Our analysis underscores that historical inequity is still present. Transit use explains some of the difference in speeds, but even among transit users, Black households face lower speeds on average.


Conclusion: Interpretation and Welfare

We find that Black commuters in Philadelphia face longer commutes than their White counterparts. Although this difference has partially closed since 1980, it is still substantial. Residential patterns play an important role in generating these differences, but commute speed is also very important. Even when comparing commuters using the same mode, Black workers’ trips are substantially slower than White workers’ trips. The racial disparity in commuting outcomes is even larger among lower-income workers and is growing worse for transit riders.

The longer commutes faced by Black workers interact with

other forms of inequality. Although average commute time has increased for all workers over the years, Black workers are not compensated for their longer commute times. Despite legal advances that aim to combat discrimination in the labor market, such as the Civil Rights Act of 1964, the Black-White earnings gap has continued to increase over the past three decades.²⁴ Ultimately, Black workers are likely to spend more time getting to work, they earn less money than their counterparts once they get there, and they face higher housing and transportation expenses.

Constrained economic opportunities and limited access to transportation are associated with the economic depression of Black communities.²⁵ Black workers who drive to work likely spend more to obtain and maintain a car, because Black car purchasers pay higher auto-loan interest rates and are approved for auto loans at lower rates.²⁶ Housing and land prices do not explain differences in commute times in the U.S. because Black households do not pay less for housing as compensation for their longer commutes.²⁷ In fact, Black homeowners on average pay higher mortgage rates, home insurance premiums, and property tax rates than those in comparable neighborhoods.²⁸

Time is an important resource for workers, and time spent commuting cannot be spent on other activities. Continuously depressed economic opportunities coupled with the longer commute times faced by Black workers will continue to stifle economic mobility. Improving access to higher-quality jobs, transportation, and housing are key to improving equity for workers. 

Transit and Race in Philadelphia and the Nation

Since the first railroad tracks were laid down in this country, race and transit have been intertwined. The case underlying the landmark Supreme Court decision *Plessy v. Ferguson* (1896)—which legitimized the “separate but equal” doctrine—was about equitable train access in New Orleans. The Montgomery Bus Boycott, ignited by the defiance of Rosa Parks and led by the Rev. Dr. Martin Luther King Jr. (among others), protested the racial segregation of public transit in Alabama. However, the problem of inequality in transportation access and within the transportation industry has not been constrained to the southern U.S. Well after *Plessy v. Ferguson* but before the Montgomery Bus Boycott, Philadelphia had its own notable struggle integrating employment in its public transportation system.

In August 1944—in the midst of World War II—thousands of White transit workers went on strike to protest the hiring of Black motormen and conductors by the Philadelphia Transportation Company (PTC). During the war, Philadelphia was a major production center for the military, crucially supplying troops with arms and gear.³⁴ The strike, which lasted nearly a week, halted the transit system in Philadelphia. More than 300,000 workers could not commute to work to produce war materials.

To get commuters back to work, the National Guard was deployed to take over the operations of the PTC and quell the civil unrest.³⁵ Under presidential authorization, the National Guard threatened strikers with the removal of their draft deferments if they did not return

to work. That threat proved sufficient to break the strike. The next week, Black workers could begin working in the higher-prestige and public-facing jobs at the PTC that they had been hired for. A year later, there were “over 900 African American drivers and conductors in the PTC system.”³⁶

A direct consequence of the strike was a loss of more than 4 million work-hours of production in the factories that produced everything from “battleships to braid for uniforms” at the height of World War II.³⁷ Had it not been for federal and military intervention, the effects of discrimination within Philadelphia’s public transportation system would have adversely rippled through the country when it needed to be its strongest.

Notes

1 See bunten et al. (2023).

2 For more about segregation in American cities, see Cortright (2020). For more about transit use in American cities, see Burrows et al. (2021), who find that about 9 percent of commuters use transit across the Philadelphia region, and about 26 percent use transit in the City of Philadelphia.

3 We borrow this “spatial mismatch” framework from Kain (1968).

4 This methodology is based on bunten et al. (2023).

5 A tract contains about 4,000 people and roughly corresponds to a neighborhood. For example, the area bounded by Arch Street, Broad Street, the Vine Street Expressway, and 7th Street in Philadelphia is one census tract and roughly corresponds to Chinatown.

6 Throughout this article, we often use 2019 to refer to data combining 2012–2019, and we use “worker” and “commuter” interchangeably.

7 Specifically, the outcome variable is the natural logarithm of commute time, and race is an indicator for whether the respondent identifies as Black. We decompose the contribution of different characteristics to the commute time differential following the approach of Gelbach (2016).

8 bunten et al. (2023) show that, if lack of access to jobs reduces the ability of potential Black workers to find work, this likely means that the reported estimates understate the true differences in commuting.

9 As an example, attending college is typically more affordable if a student comes from a wealthy family, but there are large racial discrepancies in wealth in the U.S. See Kuhn et al. (2020). So, if discrimination plays a role in racial wealth differences, it then reduces the likelihood of obtaining a college degree, which then alters the commute time because different jobs are available to those with and without college degrees. Thus, controlling for college degree “explains” where some of the racial difference in commute times comes from, but it does not rule out unequal treatment through that channel.

10 Controlling for mode, Black workers commute a 22 percent shorter distance than White workers, and these trips are about 33 percent slower.

11 When considering all trips, those by Black travelers are 24 percent shorter in distance and 56 percent slower if we do not account for mode. Thus, their trips take 32 percent longer on average. If we account for mode, trips by Black travelers are 31 percent shorter and 50 percent slower, resulting in trips that are 19 percent longer on average.

12 The average commute time in the U.S. as of 2019 is 26.3 minutes for White workers and 28.5 minutes for Black workers. See bunten et al. (2023).

13 See Lazo and George (2020).

14 See Cutler and Glaeser (1997), Ananat (2011), Boustan (2011), and Chyn et al. (2022).

15 The dissimilarity index, which reflects the relative distribution of different races across geographic areas, is a measure of residential segregation. Higher values indicate higher levels of segregation. The dissimilarity index declined only slightly for Greater Philadelphia during this period, from 0.76 to 0.66. See bunten et al. (2023).

16 Yet, this persistence is not (entirely) destiny. Some neighborhoods where very few Black Philadelphians lived in 1980 now have substantial Black populations (for example, the Olney neighborhood in North Philadelphia).

17 See Miller (2022).

18 See Macrotrends (2023). The rapid suburbanization in Greater Philadelphia was in part due to the City of Philadelphia’s wage and business taxation policies, which reduced within-city employment rates. See Haughwout et al. (2004).

19 In contrast, Black households have substantially suburbanized in the nation as a whole. See Bartik and Mast (2021).

20 Labor market access here is measured as a weighted average of jobs within the Greater Philadelphia area, where the weights decay with distance from residential locations. See bunten et al. (2022).

21 See LeRoy and Sonstelie (1983) and Glaeser et al. (2008). In Philadelphia in particular, the streetcar system and later the subway system drove the dynamics of density and desirability in Philadelphia neighborhoods before the automobile. See Gin and Sonstelie (1992).

22 See Saksa (2017). These numbers do not account for miles traveled per rider, because SEPTA doesn’t track faregate exits. However, we do know that vehicle miles traveled is only about 20 percent higher for regional rail, whereas total ridership is two to three times higher for urban rail.

23 See Fitzgerald (2023).

24 See Daly et al. (2017).

25 See Hu (2021).

26 See Butler et al. (2023).

27 See Glaeser et al. (2008) and bunten et al. (2023).

28 See Aronowitz et al. (2020).

29 See Barrero et al. (2023).

30 See Parker et al. (2022).

31 See Gould and Shierholz (2020) and Asfaw (2022).

32 Authors’ calculations from the Census Household Pulse Survey.

33 See Young et al. (2021).

34 See Temple University Libraries (n.d.).

35 See Winkler (1972).

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Banking Trends

The Rise of the Single-Family REIT

A new investment vehicle spread rapidly after the Great Financial Crisis. Should we be concerned?

Edison Yu

Economic Advisor and Economist
FEDERAL RESERVE BANK OF PHILADELPHIA

The views expressed in this article are not necessarily those of the Federal Reserve.

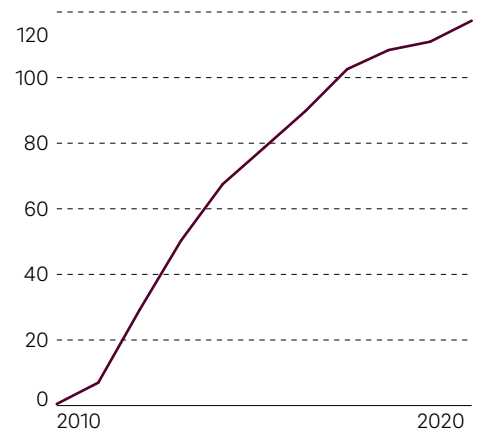
Single-family real estate investment trusts (SF REITs) have emerged as significant players in the housing market. To put this growth into perspective, the holdings of the three currently largest SF REITs were close to zero in 2010. Fast forward to 2020, and these three SF REITs held a large portfolio of single-family homes (Figure 1). Just one SF REIT, Invitation Homes, held about 80,000 single-family homes at the end of 2020. Although this only represents about 0.2 percent of the total single-family housing stock, SF REITs like Invitation Homes have concentrated their holdings in certain locations, so in some neighborhoods SF REITs own close to 5 percent of the housing stock, making them significant actors in those areas.

In this article, I take a closer look at SF REITs and their impact on the single-family housing market. I first define “REIT” and

FIGURE 1

SF REITs Ballooned After 2010

Just the three largest SF REITs owned 120,000 single-family homes by 2020. Top three SF REIT holdings, thousands of units, 2010–2020



Source: CoreLogic.

Note: Data only from Arizona, California, Florida, Georgia, North Carolina, Nevada, South Carolina, and Texas.

“SF REIT” and explain some of their tax advantages. I then highlight the distinct characteristics and investment strategies of SF REITs.

Next, I explore the implications of SF REITs’ presence in the single-family housing market. One major concern is that SF REITs, which typically acquire single-family homes with cash, may out-compete individual buyers who rely on mortgage financing. This could make it more difficult for individuals to become homeowners, particularly in markets where SF REITs are acquiring properties. Additionally, the influx of SF REITs may drive up home prices, making housing less affordable for prospective homebuyers.

However, SF REITs may stabilize the housing market by increasing the supply of rental properties and improving property management practices. They may also offer diversified investment opportunities for individuals who wish to participate in the real estate market indirectly. I conclude this article by discussing these potential benefits.

Defining the REIT

A REIT is a corporation that invests in a portfolio of real estate properties or related mortgage investments. These portfolios typically comprise residential and commercial properties. REITs function as large-scale landlords, acquiring properties and collecting rent from tenants.

REITs attract a wide range of investors, ranging from individual households to institutional investors such as pension funds, endowments, foundations, insurance companies, and banks. One key advantage of REITs is that many of them are publicly traded. This means that investors can easily buy and sell shares of REITs on stock exchanges, just like regular stocks. Thus, a REIT provides a level of liquidity and flexibility that traditional real estate ownership often lacks.

REITs offer tax advantages that set them apart from traditional corporations. First, they avoid double taxation. Unlike most corporations, REITs typically do not pay corporate taxes on their earnings. Instead, they distribute their untaxed income to shareholders, who are then taxed at the individual level. This allows for a more favorable tax treatment because the income is taxed only once. Another relatively new tax advantage of REITs is their ability to pass through deductions under the Tax Cuts and Jobs Act of 2017. REIT dividends may qualify for a deduction of up to 20 percent of the pass-through income.

To qualify for this advantageous tax treatment, a REIT must adhere to requirements set forth by the 1960 REIT Act.

First, no REIT may generate income through property flipping.¹ To enforce this prohibition, the Securities and Exchange Commission (SEC) requires each REIT to meet an annual income test.² Although the tax code is complicated and there are many ways to meet this test, REITs typically satisfy the income test by keeping rental-income-producing properties for at least two years, and by not selling more than seven properties in a year.³ REITs that fail this test may pay a corporate tax and, potentially, a penalty tax of up to 100 percent on any “trading” income from properties sold too soon.⁴

Second, REITs must invest primarily in real estate. To enforce this rule, the SEC requires each REIT to invest at least 75 percent

of its total assets in real estate. The REIT must also derive at least 75 percent of its gross income from real estate-related sources, such as rental income and proceeds from sales of real property.

Third, the primary beneficiaries of a REIT must be its shareholders. To enforce this requirement, the SEC mandates that each REIT distribute at least 90 percent of its taxable income to shareholders annually in the form of dividends.

These requirements incentivize REITs to focus on long-term real estate investments and the distribution of income to shareholders. To meet these requirements (and thus maintain their advantageous tax status), REITs typically hold onto their real estate properties—unlike “home flippers,” who engage in short-term buying and selling.

Defining the SF REIT

Single-family REITs, or SF REITs, are a specialized type of REIT. Unlike traditional REITs—which primarily invest in multifamily residential properties, retail commercial properties, offices, and other industrial or commercial properties—SF REITs specifically target single-family homes.

Like other REITs, an SF REIT collects rent from tenants and distributes this rental income to its investors. In essence, it functions as a large-scale landlord for single-family homes. SF REITs arose after the 2007-2008 Great Financial Crisis (GFC). There is no consensus on why REITs did not target single-family homes before then. However, several factors contributed to the emergence of SF REITs in the postcrisis period.

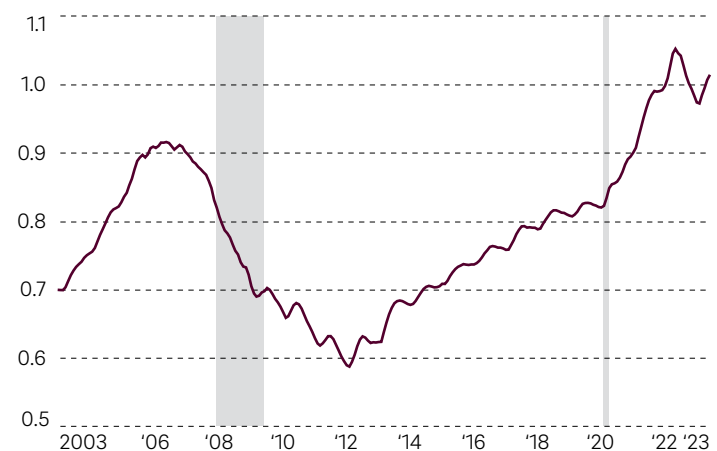
The housing crisis during the GFC led to lower prices for houses. Residential house prices dropped 27 percent from peak to trough, and it wasn’t until 2021 that real house prices adjusted

FIGURE 2

Housing Prices Cratered After the Great Financial Crisis

The glut of foreclosed homes allowed SF REITs to purchase properties at lower prices.

s&P/Case-Shiller U.S. National Home Price Index divided by Consumer Price Index for all urban consumers



Sources: Federal Reserve Bank of St. Louis, S&P Dow Jones Indices LLC, and U.S. Bureau of Labor Statistics, retrieved from FRED, Federal Reserve Bank of St. Louis, <https://fred.stlouisfed.org/series/CSUSHPINSA> and <https://fred.stlouisfed.org/series/CPIAUCSL>.

Note: CPI is city average of all items less food and energy in U.S.; shaded areas indicate U.S. recessions.

for inflation recovered and reached their precrisis level in real terms (Figure 2). The availability of foreclosed homes for sale after the crisis allowed institutional investors, including SF REITs, to purchase these properties at lower prices. The lower purchase prices increased the potential rental yields for single-family homes, making them an attractive option for REITs seeking to generate rental income.

At the same time, the Federal Reserve implemented measures—such as pushing short-term interest rates to zero and engaging in quantitative easing—that lowered the cost of financing the purchase of real estate properties (Figure 3).⁵ This made it financially feasible for more investors, including REITs, to acquire single-family homes as rental properties.⁶

Furthermore, the GFC resulted in an increased demand for single-family rentals. Many households had lost their homes through foreclosure or a short sale during the housing bust and did not have any wealth to purchase a new home. In addition, credit standards were tightened in the aftermath of the GFC, and many households were wary of taking on additional debt to purchase a new home. These factors all contributed to the lower homeownership rate and the higher demand for rental housing (Figure 4).

Information technology has also played a role in the rise of SF REITs. Because

single-family homes are more diverse and dispersed, it can be more difficult to price and manage a portfolio of single-family homes. However, advancements in technology, such as the availability of housing information through platforms like Zillow, have made it easier for SF REITs to more accurately price single-family homes, especially those with similar characteristics. This, in turn, has made it easier for SF REITs to expand and manage their portfolios of single-family homes.⁷

SF REITs have been part of a broader trend toward institutional ownership of single-family homes as opposed to owner-occupied homes and traditional “mom and pop” investors.⁸ What makes SF REIT ownership special is its fast-increasing scale, concentration among certain neighborhoods, and long-term ownership structure. These all contribute to concerns about their effect, particularly in the areas they target.

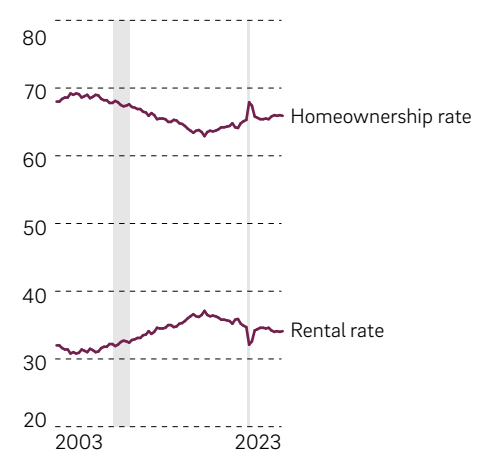
Where SF REITs Invest, and What They Invest In

Because SF REITs are investing for rental income, they tend to invest in single-family houses with a higher rental yield. As a result, they tend to avoid investing in the most expensive cities, such as New York, which offer faster price appreciation but a lower rental yield. Instead, SF REITs

FIGURE 4

The Rate of Homeownership Declined as the Demand for Single-Family Rentals Increased During the Great Financial Crisis

Proportion of homes that are occupied by their owners, 2003–2023



Source: Federal Reserve Bank of St. Louis and Board of Governors of the Federal Reserve System (U.S.), retrieved from FRED, Federal Reserve Bank of St. Louis, <https://fred.stlouisfed.org/series/RHORUSQ156N>.

Note: Shaded areas indicate U.S. recessions.

target Sunbelt cities such as Atlanta and Dallas, where rental yields are higher. Sunbelt states also have a larger housing supply and fewer rental market restrictions, making them attractive for SF REITs seeking to acquire rental properties.⁹

The Sunbelt’s more homogeneous

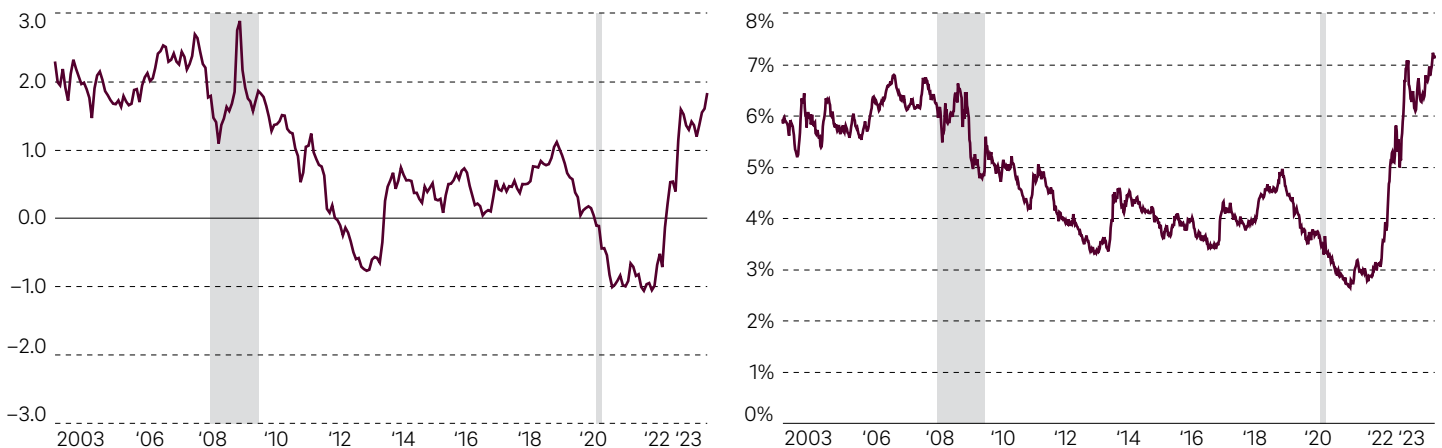
FIGURE 3

The Fed’s Response to the Great Financial Crisis Lowered Financing Costs

Low short-term interest rates enabled SF REITs to acquire and rent houses.

(left) Market yield of U.S. Treasury securities at 10-year constant maturity, quoted on an investment basis, inflation-indexed, 2003–2023

(right) Freddie Mac, 30-year fixed-rate mortgage average in the U.S. [MORTGAGE30US], 2003–2023



Source: Federal Reserve Bank of St. Louis and Board of Governors of the Federal Reserve System (U.S.), retrieved from FRED, Federal Reserve Bank of St. Louis, <https://fred.stlouisfed.org/series/DFI110> and <https://fred.stlouisfed.org/series/MORTGAGE30US>.

Note: Shaded areas indicate U.S. recessions.

housing stock also makes it easier to price and manage its properties. “Cookie-cutter” homes in large developments are much easier to price due to their similarity and their proximity to each other. In contrast, single-family homes in older cities were constructed over a longer period, leading to greater variation in their designs and construction standards.

The SEC filing of Invitation Homes, the largest SF REIT, reveals this concentration of holdings in the Sunbelt. Arizona, California, Florida, Georgia, Nevada, North Carolina, South Carolina, and Texas constituted 86 percent of Invitation Homes’ total holdings by the end of 2021. Other major SF REITs exhibit a similar pattern of investment.

In addition, Sunbelt cities have become attractive investment locations due to their favorable rental market conditions. These areas often have a higher proportion of younger residents and faster population growth, providing the potential for increased demand and, thus, increased rental income.¹⁰

Even within the Sunbelt, SF REITs tend to concentrate their investments in specific areas. For example, the three largest SF REITs own significant shares of single-family homes in certain zip codes (Figure 5). In many of these zip codes, SF REITs own close to 5 percent of the single-family housing stock. Although these SF REITs lose the benefit of a more diversified portfolio, they capitalize on the advantages of an economy of scale. By clustering their investments geographically, SF REITs streamline property management and repair services, leading to increased operational efficiency. For example, a single technician can repair multiple air conditioners on a hot day if the houses are near each other rather than scattered across different cities. In addition, SF REITs work with developers and commit to buy some fraction of homes being developed, providing another potential economy of scale.

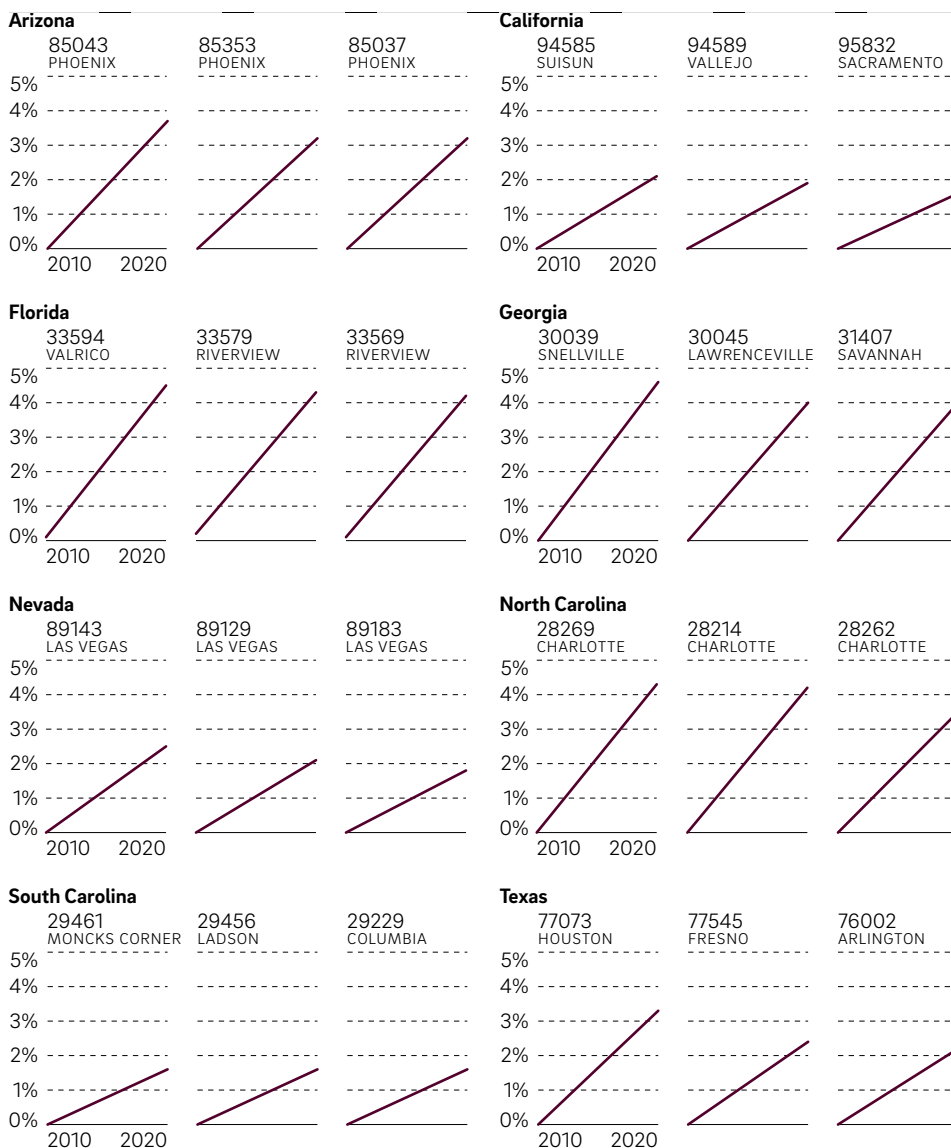
Another characteristic of SF REITs’ investment strategy is their preference for buying entry-level homes. Although not exclusively focused on SF REITs, one article shows that large corporate buyers concentrated their holdings in low-income, historically nonwhite neighborhoods in Atlanta, Miami, and Tampa during the COVID-19 pandemic.¹¹ Homes in these

FIGURE 5

SF REITs Tend to Concentrate Their Investments in Specific Areas

Although SF REITs lose the benefit of a more diversified portfolio, they capitalize on economies of scale.

Zip codes with highest share of properties owned by the top three SF REITs, 2010 and 2020



Source: CoreLogic.

less-luxurious areas are particularly popular among renters. By investing in entry-level homes, SF REITs can tap into a larger rental market and cater to the needs of a younger demographic. However, this means first-time homebuyers likely compete with SF REITs.

Why Worry About SF REITs?

SF REITs, as institutional investors, compete with individual homebuyers in the housing market. Unlike most individual homebuyers, however, SF REITs

can pay cash. Sellers generally prefer cash offers due to the associated benefits, such as a shorter time-to-close and a lack of a mortgage financing contingency clause.¹² Indeed, recent research shows that a cash purchase is linked to a 16 percent reduction in the time required to complete a housing sale, and sellers are willing to accept a price discount of 5 to 7 percent for the faster and more dependable cash offers.¹³

Because SF REITs have such concentrated portfolios, they exacerbate competition in neighborhoods popular among first-time homebuyers. And because

homeownership is how most U.S. households build wealth, the difficulty homebuyers face in purchasing their first home can have long-term financial consequences.¹⁴ With SF REITs targeting these neighborhoods, it becomes even more challenging for individual homebuyers to enter the housing market and build wealth.¹⁵

Research indicates that institutional investors, including SF REITs, outbid individual homebuyers, further exacerbating market competition.¹⁶ According to this research, the increasing presence of institutional investors in the housing market explains over half of real house price appreciation between 2006 and 2014, and the market entry of institutional investors contributed to the decline in the homeownership rate during that period. However, we need to conduct further research to understand the dynamics and implications of this more-recent period.

But SF REITs Have Their Benefits, Too

However, SF REITs benefit both investors and renters in the real estate market. For investors, SF REITs offer a more convenient way to invest in multiple single-family homes. Investing in real estate can be expensive, making it challenging for individual investors with limited funds to diversify their portfolios. An SF REIT solves this problem by pooling resources from multiple investors and allowing them to benefit from the diversification of investments across various properties.

Investors in SF REITs enjoy benefits like those available to individual homeowners and small real estate investors. For instance, SF REIT investors can deduct interest payments as expenses—much as individual homeowners can deduct the interest they pay on their mortgages. This tax advantage can lower the overall tax liability for SF REIT investors and improve their investment returns.

SF REITs also benefit renters, particularly renters in the single-family housing market. SF REITs increase the availability of rental properties in areas where options were previously limited. For example, SF REITs increasingly invest in built-for-rent single-family homes, and their investment encourages new construction of those homes. The increasing number of built-for-rent single-family homes might alleviate the housing supply shortage. By investing in housing development, SF REITs contribute to the expansion of the rental stock in these neighborhoods, addressing the demand for housing. One study found that the share of built-


for-rent housing starts (out of all single-family housing starts) increased from almost zero in 1974 to about 4 percent in 2020.¹⁷ This trend aligns with the broader interest of SF REITs in the Sunbelt, as it allows them to focus on areas where the housing stock is more homogeneous, making pricing and management more efficient. This increased supply provides renters with more options and helps alleviate rental market pressures.

SF REITs also make living in desirable suburban neighborhoods more affordable for renters, particularly young households. SF REITs enable individuals and families to reside in desirable locations without the hassle of purchasing a home or the burden of carrying a mortgage. A recent research paper shows that institutional housing investors may improve renter welfare. It finds that concentrated institutional ownership increases housing rents but reduces local crime rates.¹⁸ SF REIT ownership increases the accessibility of housing options and allows renters to enjoy the amenities and benefits associated with these neighborhoods.

Conclusion

The emergence of SF REITs has garnered attention. Although SF REITs are still relatively small in the overall housing market, their rapid growth, particularly in certain locations, has raised concerns regarding their potential impact on individual homeownership. These concerns arise because SF REITs often acquire properties with cash, which makes it challenging for individuals to compete with them in the housing market.

However, SF REITs provide benefits to both investors and renters. Investors can take advantage of the opportunities offered by SF REITs to invest in a diversified portfolio of single-family homes. Renters can benefit because SF REITs increase the availability of rental properties in areas where there was previously a limited supply. This expansion of rental options addresses housing needs and provides individuals with more choices for their living arrangements.

Considering the concerns raised and the potential benefits of SF REITs, further research is necessary to assess the costs and benefits associated with their presence in the single-family housing market. Understanding the full impact of SF REITs will allow policymakers to develop appropriate strategies to ensure a balanced housing market.¹⁹ 

Notes

- 1** This “investment term” rule makes clear that REITs are intended for long-term real estate investments rather than short-term buying and selling. See Schneider et al. (2022).
- 2** See the 2011 SEC bulletin for an overview.
- 3** This is called a safe harbor rule.
- 4** See Lecha (2020) for more details.
- 5** See Drozd (2018) and Yu (2016) for examples.
- 6** Although SF REITs do not use mortgages to purchase individual real estate properties, they borrow at the corporation level, and the cost of issuing equity is linked to external financing costs.
- 7** See Dezember (2018) and Cashdan (2021) for examples.
- 8** See Lambie-Hanson, Li, and Slonkosky (2018).
- 9** See Immergluck (2022).
- 10** See Hermann (2021).
- 11** Raymond et al. (2022).
- 12** A mortgage financing contingency clause allows a potential buyer of the house to back out of a real estate transaction if their mortgage application is rejected. The seller would then have to return the initial deposit. This would likely lead to the property being relisted, delaying the sale.
- 13** Han and Hong (2023).
- 14** A rent-to-own agreement, which allows a renter to commit to renting a property for a specific period, with the option of buying it before the lease runs out, is rarely used for properties owned by SF REITs.
- 15** See Turner and Luea (2009), for example. However, this might benefit the homeowners in these neighborhoods due to higher housing prices. See Li and Rui (2006) and U.S. Department of Housing and Urban Development (2023).
- 16** See Lambie-Hanson, Li, and Slonkosky (2022). They classify a transaction as having an institutional buyer or seller if the property is bought or sold by a company instead of a named individual.
- 17** Hermann (2021).
- 18** Gurun et al. (2023).

19 In his 2023 *Economic Insights* article, Philadelphia Fed economist Kyle Mangum explains how housing policy can mitigate the negative impact of housing market investors.

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Research Update

These papers by Philadelphia Fed economists, analysts, and visiting scholars represent preliminary research that is being circulated for discussion purposes.

The views expressed in these papers are solely those of the authors and should not be interpreted as reflecting the views of the Federal Reserve Bank of Philadelphia or Federal Reserve System.

Lending by Servicing: Monetary Policy Transmission Through Shadow Banks

We propose a new conceptual framework for monetary policy transmission through shadow banks in the mortgage market that highlights the role of mortgage servicing in generating nondeposit funds for lending. We document that mortgage servicing acts as a natural hedge against interest rate shocks and dampens the effect of monetary policy on shadow bank mortgage lending. Higher interest rates reduce prepayment risk, increasing the collateral value of mortgage servicing assets and cashflow from servicing income. This enables shadow banks with greater exposure to mortgage servicing to obtain more funding. The mortgage servicing channel is weaker for traditional banks due to their reliance on deposit funding and the capital charge on mortgage servicing assets. Our estimates imply that the rising share of shadow banks in mortgage servicing has weakened the pass-through of monetary policy to aggregate mortgage lending.

WP 23-14. Isha Agarwal, Sauder School of Business, University of British Columbia; Malin Hu, Department of Economics, Vanderbilt University; Raluca A. Roman, Federal Reserve Bank of Philadelphia Supervision, Regulation, and Credit Department; Keling Zheng, Sauder School of Business, University of British Columbia.

Scalable Demand and Markups

We study changes in markups across 72 product markets from 2006 to 2018. A growing literature has documented a rise in markups over time using a production function approach; we instead employ the standard microeconomic method, which is to estimate demand and then invert firms' first-order pricing conditions to infer their markups. To make the method scalable, we propose estimating nested logit demand models, using household panel data to automate the assignment of products to nests. Our results indicate an overall upward trend in markups between 2006 and 2018, with considerable heterogeneity across and within product markets. We find that changes in firms' marginal costs and households' price sensitivity are the primary drivers of markup increases, with changes in firm ownership playing a much smaller role.

WP 23-15. Enghin Atalay, Federal Reserve Bank of Philadelphia Research Department; Erika Frost, Economics Department, University of Wisconsin-Madison; Alan Sorensen, Economics Department, University of Wisconsin-Madison and NBER; Christopher Sullivan, Economics Department, University of Wisconsin-Madison.

Economic Activity by Race

We observe empirical differences between races across various macroeconomic variables for the White, Black, Asian, and Hispanic populations in the U.S. For instance, the Black unemployment rate in the U.S. is more often than not double the White unemployment rate. In this paper, I treat nine macroeconomic variables as noisy indicators of economic activity and estimate an index that measures the economic activity of racial demographic groups in the U.S., called Economic Activity by Race (EAR). The noise of the indicators motivates the use of Kalman filter estimation to extract a common component from the noisy indicator variables. My index suggests that there are empirical differences between Black and White economic activity in the U.S., supporting the disparities found between races in racial stratification literature. Further, my results suggest that a structural shock to White economic activity is more persistent than a structural shock to Black, Asian, or Hispanic economic activity due to more heterogeneous sensitivity to various measures of economic well-being.

WP 23-16. Fatima Mboup, Federal Reserve Bank of Philadelphia Research Department.

Failing Just Fine: Assessing Careers of Venture Capital-backed Entrepreneurs via a Non-Wage Measure

This paper proposes a nonpecuniary measure of career achievement: seniority. Based on a database of over 130 million resumes, this metric exploits the variation in how long it takes to attain job titles. When nonmonetary factors influence career choice, assessing career attainment via nonwage measures, such as seniority, has significant advantages. Accordingly, we use our seniority measure to study labor market outcomes of VC-backed entrepreneurs. Would-be founders experience accelerated career trajectories prior to founding, significantly outperforming graduates from same-tier colleges with similar first jobs. After exiting their start-ups, they obtain jobs about three years more senior than their peers who hold (i) same-tier college degrees, (ii) similar first jobs, and (iii) similar jobs immediately prior to founding their company. Even failed founders find jobs with higher seniority than those attained by their nonfounder peers.

WP 23-17. Natee Amornsiripanitch, Federal Reserve Bank of Philadelphia Supervision, Regulations, and Credit Department; Paul A. Gompers, Harvard Business School and NBER; George Hu, Harvard University; Will Levinson, Harvard Business School; Vladimir Mukharlyamov, McDonough School of Business, Georgetown University.

The Effects of Racial Segregation on Intergenerational Mobility: Evidence from Historical Railroad Placement

This paper provides new evidence on the causal impacts of citywide racial segregation on intergenerational mobility. We use an instrumental variable approach that relies on plausibly exogenous variation in segregation due to the arrangement of railroad tracks in the 19th century. Our analysis finds that higher segregation reduces upward mobility for Black children from households across the income distribution and White children from low-income households. Moreover, segregation lowers academic achievement while increasing incarceration and teenage birth rates. An analysis of mechanisms shows that segregation reduces government spending, weakens support for antipoverty policies, and increases racially conservative attitudes among White residents.

WP 23-18. Eric Chyn, University of Texas at Austin and NBER; Kareem Haggag, UCLA and NBER; Bryan A. Stuart, Federal Reserve Bank of Philadelphia Research Department and IZA.

Urban Renewal and Inequality: Evidence from Chicago's Public Housing Demolitions

This paper studies one of the largest spatially targeted redevelopment efforts implemented in the United States: public housing demolitions sponsored by the HOPE VI program. Focusing on Chicago, we study welfare and racial disparities in the impacts of demolitions using a structural model that features a rich set of equilibrium responses. Our results indicate that demolitions had notably heterogeneous effects where welfare decreased for low-income minority households and increased for White households. Counterfactual simulations explore how housing policy mitigates negative effects of demolitions and suggest that increased public housing site redevelopment is the most effective policy for reducing racial inequality.

WP 23-19. Milena Almagro, University of Chicago; Eric Chyn, University of Texas at Austin and NBER; Bryan A. Stuart, Federal Reserve Bank of Philadelphia Research Department.

I've Got 99 Problems But a Bill Ain't One: Hospital Billing Caps and Financial Distress in California

We examine the financial consequences of the 2007 California Fair Pricing Law (FPL), a law that places a price ceiling on hospital bills for uninsured and financially vulnerable individuals. Using difference-in-difference-in-differences models, we exploit cross-sectional variation in exposure to the law to estimate the causal effects of the FPL on different measures of financial distress. We find that the law reduces the medical and nonmedical debt burden of individuals targeted by the law, with the likelihood of incurring nonmedical debt in collections declining by 14.5 percent and the number of nonmedical collections declining by 31 percent. The law also reduces the probability of having medical and nonmedical debt balances between \$1 and \$1,000 in collections by 16.5 percent and 40 percent, respectively. Our results suggest that hospital billing regulations have direct and indirect effects on the personal financial outcomes of uninsured and financially vulnerable individuals.

WP 23-20. Yaa Akosa Antwi, Johns Hopkins University and Federal Reserve Bank of Philadelphia Consumer Finance Institute Visiting Scholar; Marion Aouad, University of California, Irvine, and Federal Reserve Bank of Philadelphia Consumer Finance Institute Visiting Scholar; Nathan Blascak, Federal Reserve Bank of Philadelphia Consumer Finance Institute.

Identification Through Sparsity in Factor Models: The l_1 -Rotation Criterion

Linear factor models are generally not identified. We provide sufficient conditions for identification: Under a sparsity assumption, we can estimate the individual loading vectors using a novel rotation criterion that minimizes the l_1 -norm of the loading matrix. This enables economic interpretation of the factors. The assumption of sparsity in the loading matrix is testable, and we propose such a test. Existing rotation criteria are theoretically unjustified and perform worse in our simulations. We illustrate our method in two economic applications.

WP 20-25 Revised. Simon Freyaldenhoven, Federal Reserve Bank of Philadelphia Research Department

The Evolution of Local Labor Markets After Recessions

This paper studies how u.s. local labor markets respond to employment losses that occur during recessions. Following recessions from 1973 through 2009, we find that areas that lose more jobs during the recession experience persistent relative declines in employment and population. Most importantly these local labor markets also experience persistent decreases in the employment-population ratio, earnings per capita, and earnings per worker. Our results imply that limited population responses result in longer-lasting consequences for local labor markets than previously thought, and that recessions are followed by persistent reallocation of employment across space.

WP 22-16 Revised. Brad Hershbein, W.E. Upjohn Institute for Employment Research; Bryan A. Stuart, Federal Reserve Bank of Philadelphia Research Department.

The Great Migration and Educational Opportunity

This paper studies the impact of the First Great Migration on children. We use the complete count 1940 Census to estimate selection-corrected place effects on education for children of Black migrants. On average, Black children gained 0.8 years of schooling (12 percent) by moving from the South to the North. Many counties that had the strongest positive impacts on children during the 1940s offer relatively poor opportunities for Black youth today. Opportunities for Black children were greater in places with more schooling investment, stronger labor market opportunities for Black adults, more social capital, and less crime.

WP 22-04 Revised. Cavit Baran, Northwestern University; Eric Chyn, University of Texas at Austin and NBER; Bryan A. Stuart, Federal Reserve Bank of Philadelphia Research Department.

Data in Focus

Economic Outlook Survey

The Philadelphia Fed collects, analyzes, and shares useful data about the Third District and beyond. Here's one example.

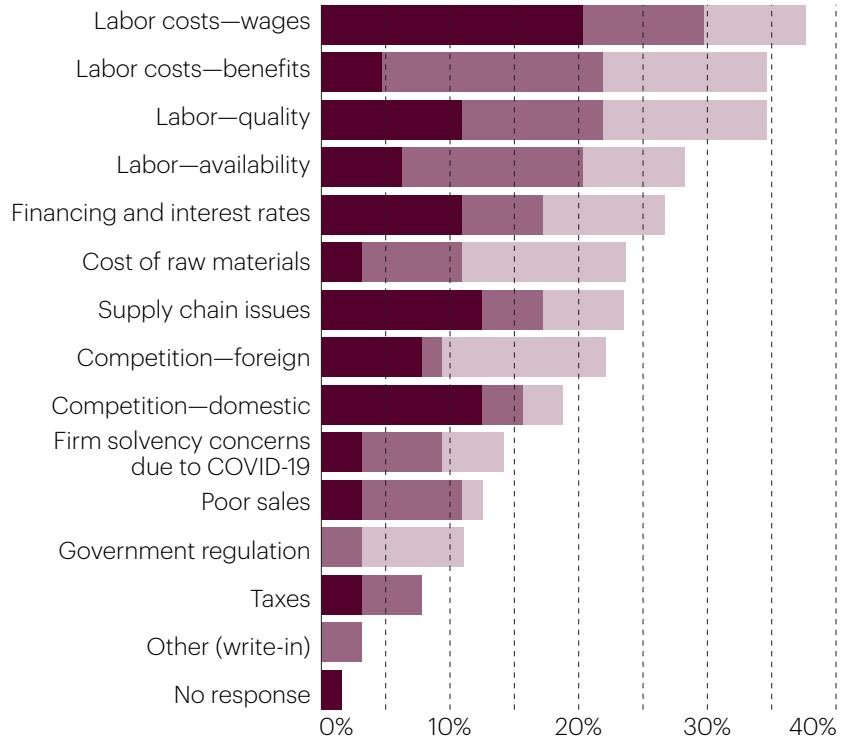
When one person tells you what they think about the economy, it's an opinion. When many people tell you, it's a survey. And when those people are members of the Chamber of Commerce for Greater Philadelphia, it's a valuable tool for gaining a real-time understanding of what's happening in the real economy. Every fall since 2010, the Philadelphia Fed has asked members of the Chamber, "What are the biggest problems facing your company?"¹ It may be tempting to dismiss their answers as mere "soft" data, unequal in importance to the "hard" data of unemployment, inflation, and gross domestic product. But as Philadelphia Fed President Pat Harker said when introducing the results of the most recent survey to the Chamber this past January, "I've come to believe that *soft* data like survey results are perhaps equally important to getting a full understanding of our economic situation. Candidly, an overemphasis on hard data can lead to policy errors." This soft data is particularly relevant in 2023: Last December, survey respondents flagged labor costs as their biggest challenge. To hire new workers or retain existing staff, many respondents said they had raised compensation, introduced a remote work policy, or promoted existing employees. All this soft data proved prescient as a tight labor market has been a defining feature of the economy so far this year. [1](#)

Notes

¹ We also ask respondents, "What is your assessment of changes in business conditions" for the region and their company. Additional questions focus on new orders, sales or revenues, prices paid, prices received, number of employees, wage and benefits costs, capital expenditures, and issues specific to that year.

Biggest Problems Facing Chamber Members in 2022

% responding, importance: ■ Most ■ Second-most ■ Third-most



Source: The Federal Reserve Bank of Philadelphia.

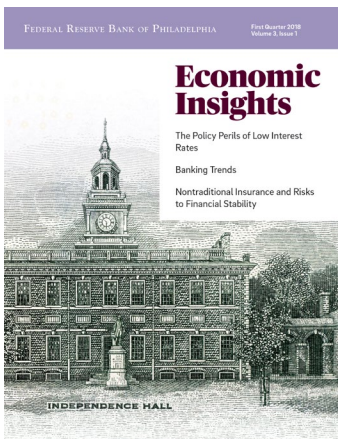
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Online: <https://www.philadelphiafed.org/surveys-and-data/regional-economic-analysis/chamber-of-commerce-for-greater-philadelphia-economic-outlook-survey>

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