

The Digest

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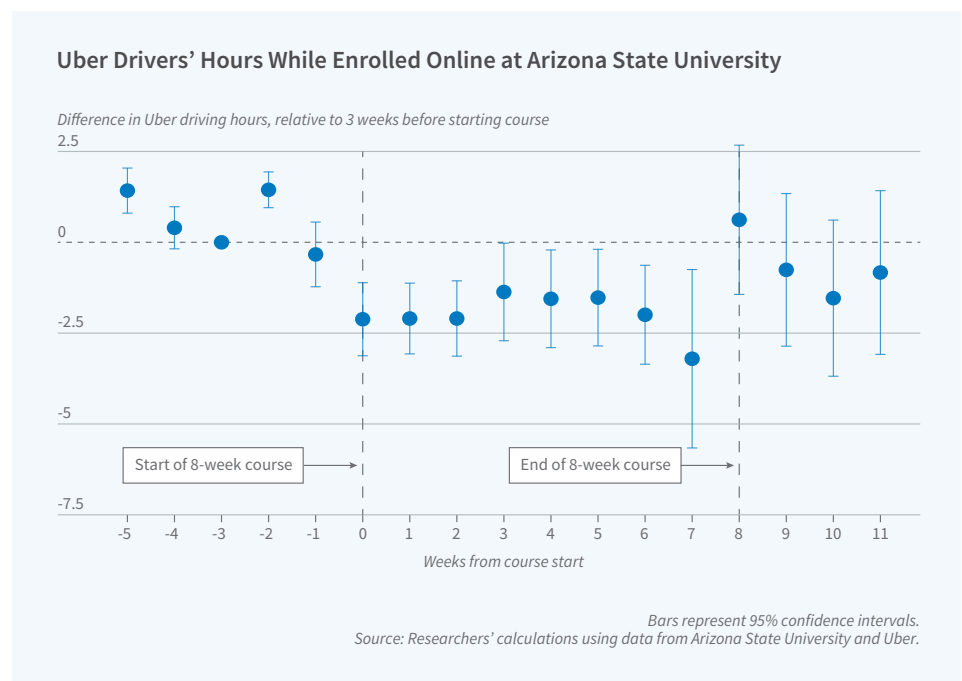
Reduced Medicaid Access, Increased Crime

Online Classes and Gig Jobs Help Balance School and Work

A growing share of US college students work part- or full-time to support themselves while studying, a trend that seems likely to continue as tuition costs rise and workers in sectors affected by technological change return to school to retrain and upskill. According to the US Department of Education, 64 percent of full-time undergraduates and 86 percent of part-time students work at least 20 hours per week.

In [Assessing the Costs of Balancing College and Work Activities: The Gig Economy Meets Online Education](#) (NBER Working Paper 32357), [Esteban Aucejo](#), [A. Spencer Perry](#), and [Basit Zafar](#) find that the flexibilities afforded by online study and gig work — two relatively recent developments — can mitigate the frictions students have typically faced when combining work with a college education.

They study Uber drivers enrolled in tuition-free online classes at Arizona State University (ASU) through a partnership between the university and the rideshare company, focusing on the extent to which participants shift between study and work as returns to these activities change, for example, when class workload intensifies or the wages for driving decline. Tuition-free classes are an important incentive for Uber driver-students to participate in the partnership, as these students show a greater sensitivity to education costs than their peers. In a survey where student Uber drivers were asked about their enrollment choices, enrollment probabilities would decrease by about 50 percent in a scenario where



costs rose from \$0 to \$6,000, the latter reflecting the regular yearly fees for an ASU working student.

By assembling data on participants' online class-related activities and their trips for Uber, the researchers can examine detailed time allocation (which otherwise is almost impossible to observe). For the average student-driver, studying costs about \$180 a month in foregone earnings, 8 percent of the average monthly earnings of a non-student Uber driver. This suggests that enrolling in online classes has a low opportunity cost for participants.

The researchers use temporary shocks to potential earnings from Uber, such as extended periods of surge pricing resulting from a large local

event, to analyze how a 10 percent increase in Uber hourly wages affects participants' study time. They find a decline in time spent on classroom activities of only 1.7 percent, or about one minute for every \$1 increase in Uber hourly wages. They also have information on the weekly workloads in various courses. A 10 percent increase in workload in a class a student is enrolled in reduces that student's time spent driving by about 1 percent. The findings show that drivers adjust their labor market engagement when college activities become more demanding, but by only modest amounts. This elasticity is low, in part due to drivers adjusting their typical driving behavior when taking the courses. In addition, the researchers do not

find any evidence that during busier academic times, drivers who are also students receive lower driver ratings or tips. Similarly, they do not detect any negative impact of driving hours on academic performance.

Finally, the researchers survey

participants to elicit their perceptions of the program. Participants expect the degree program to substantially increase their long-run earnings and report that the flexibility of online learning makes them significantly more likely to attempt to attain a bachelor's degree.

Only 37 percent of participants said they would have pursued a degree if the Uber-ASU program were not an option, indicating their valuation of the program's flexibility.

—Shakked Noy

Gas-for-Coal Substitution in US Electricity Generation

Coal-fired power plants generate about 20 percent of US electricity. Prioritizing the generation of electricity using natural gas could immediately replace at least two-thirds of coal-fired generation in the US and reduce carbon dioxide emissions from the electricity sector by at least 18 percent. That would correspond to a reduction of between 5 and 8 percent of total US energy-related CO₂ emissions, at a cost of \$49 to \$92 per ton of CO₂, according to a new study, [On the Feasibility, Costs, and Benefits of an Immediate Phasedown of Coal for US Electricity Generation](#) (NBER Working Paper 32235), by [Stephen P. Holland](#), [Matthew Kotchen](#), [Erin T. Mansur](#), and [Andrew J. Yates](#).

The researchers analyzed 2022 data from the Continuous Emission Monitoring System (CEMS) of the Environmental Protection Agency (EPA), which tracks hourly generation for each fossil fuel powered plant over 25 megawatts. Their sample includes 385 coal fired plants and 2,550 natural gas fired plants. Average hourly generation was 86 gigawatt hours for coal and 143 gigawatt hours for natural gas.

The capacity of each natural gas plant was estimated from data on observed power generation over the previous decade. Hourly spare natural gas capacity was determined by subtracting hourly generation from estimated capacity. For six geographical electricity transmission regions in the US, aggregate spare natural gas capacity substantially exceeds coal generation. This calculation, however, does not account for many constraints that may prevent direct substitution of natural gas for coal. Accordingly, the researchers assume that when a low-cost natural gas plant is not operating, using it to replace coal-fired generation is not feasible because there must be

an unobserved constraint that prevented the gas-fired plant from operating. Therefore they assume that only higher-cost natural gas plants within the geographic region are available for replacing coal-fired generation.

Under their preferred counterfactual, in every region but the Northeast, coal is necessary to generate enough electricity to meet demand at least some of the time. In the Mid-Atlantic and Midwest, the natural gas capacity shortfall is between 7 and 8 percent of net load. Coal generation to keep the lights on in Texas and the West would be about 5 percent of net load. In the Southeast it would be less than 1 percent. A key insight, therefore, is that while there appears to be significant scope for existing natural gas units to replace coal for electricity generation, fully eliminating coal while continuing to meet electricity demand is not possible with existing generators.

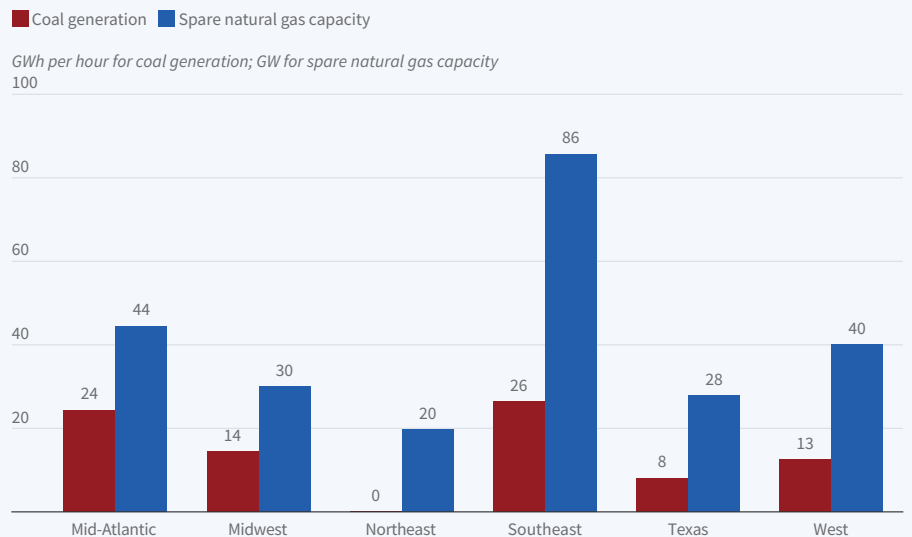
Assigning priority to gas genera-

tion would increase power generation costs by an estimated \$20.4 billion a year, with the biggest increases in the Midwest, Southeast, and West. When limitations on pipeline capacity for transporting natural gas are taken into account, the extent of possible coal replacement declines from 94 to 82 percent and the decline in CO₂ emissions falls by about 10 percent.

The researchers' estimate of the cost of eliminating a short ton of CO₂ with gas-for-coal substitution is well below the EPA's estimate of \$170 per short ton for the social cost of carbon. There are also significant public health benefits from reducing the local pollutants of sulfur dioxide and nitrogen oxides. Their analysis suggests that despite the increased costs, implementing gas-for-coal substitution given the existing set of electricity generating units is likely to pass a benefit-cost test.

—Linda Gorman

Electricity Generated with Coal and Spare Natural Gas Capacity, 2022



Source: Researchers' calculations using data from the US Environmental Protection Agency.

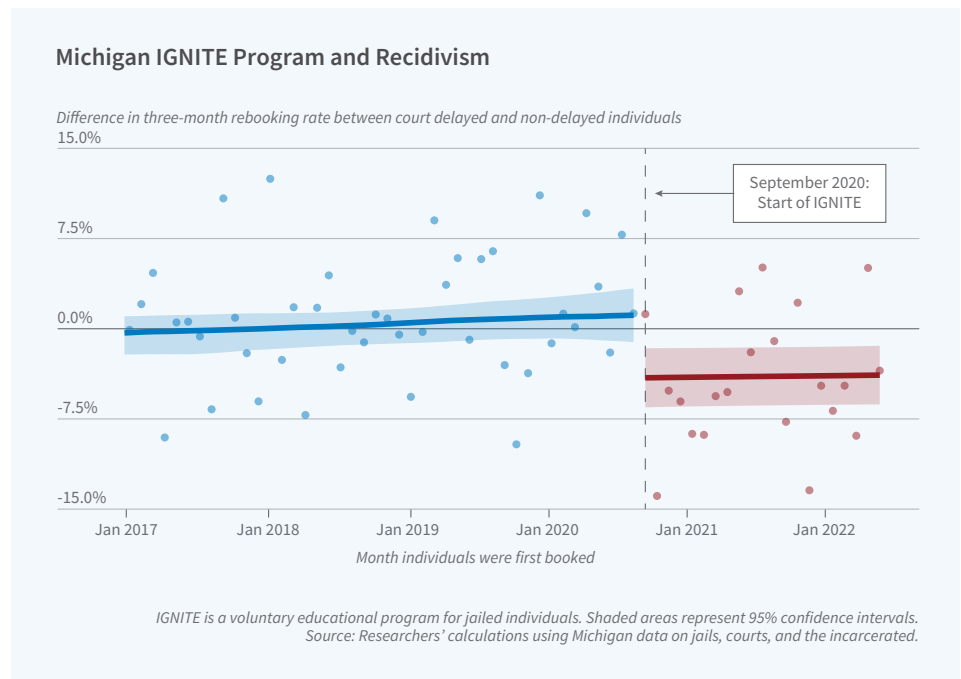
Reducing Inmate Misconduct and Recidivism

Within-jail misconduct and recidivism rates upon release were significantly reduced when jailed individuals had access to a free education and training program, [Marcella Alsan, Arkey M. Barnett, Peter Hull, and Crystal Yang](#) find in “Something Works” in [US Jails: Misconduct and Recidivism Effects of the IGNITE Program](#) (NBER Working Paper 32282).

The researchers study the Inmate Growth Naturally and Intentionally Through Education (IGNITE) program in Flint, Michigan. The program offers tailored educational courses and training to all jailed individuals for two hours a day, five days a week. Courses include basic literacy, GED test preparation, classes for college credit, and training in food handling, commercial driving, masonry, and welding. The program is low cost, largely using existing county resources and staff. Participation is optional, but take-up is encouraged by program participants having access to tablets which they may use to view approved entertainment and games during free time. Program data suggest around 90 percent of inmates opt in.

To study the effects of IGNITE, the researchers construct a database of approximately 23,500 jail stays from January 2016 to May 2022. They combine information from the county’s Jail Management System and District and Circuit Court Registers of Actions to create both a court interaction timeline and a behavioral profile for each jailed individual. Using delays in court appointments as a random source of variation in an individual’s jail time, they compare misconduct and recidivism effects before and after the launch of the IGNITE program in September 2020.

They find that each additional month of access to the IGNITE program was associated with 0.15 fewer incidents of major misconduct per



week and a 9 percentage point fall in the likelihood of rearrest and re-jailing within three months — both amounting to around a 25 percent reduction. The recidivism reduction increases over time, with a 17 percentage point (19 percent) decline after one year, and the improvements are concentrated among individuals with the highest risk of rearrest.

The researchers discover that 90 percent of the jailed population spent four months or less in the facility, with an average stay of six weeks. Around 40 percent of those who were jailed experienced a court-related delay, and those delays added an average of two weeks to their incarceration. In the full data sample, 18 percent of the inmates were rearrested and re-incarcerated within three months of release, though those responsive to court delays had much higher recidivism rates.

Prior to the launch of the IGNITE program, court delays were associated with an uptick in individual misconduct and had no effect on recidivism. In contrast, after the program began,

court delays were instead associated with reduced misconduct rates and significant reductions in three-month and one-year recidivism.

The researchers suggest two potential explanations for the significant drops in misconduct and recidivism. One is the tangible improvement in literacy and numeracy skills. Pre- and post-training assessments suggest that program participants gained, on average, a full grade level in both math and reading — a significant change for such a short time period. The other, based on surveys of the local community and jail staff, is that the program ushered in a significant cultural shift among jailed individuals, jail staff, and the broader community. Surveys found that jailed individuals and their families reported better perceptions of law enforcement after participating in the program, and that jail staff reported better perceptions of the ability of educational programs to help rehabilitate incarcerated individuals.

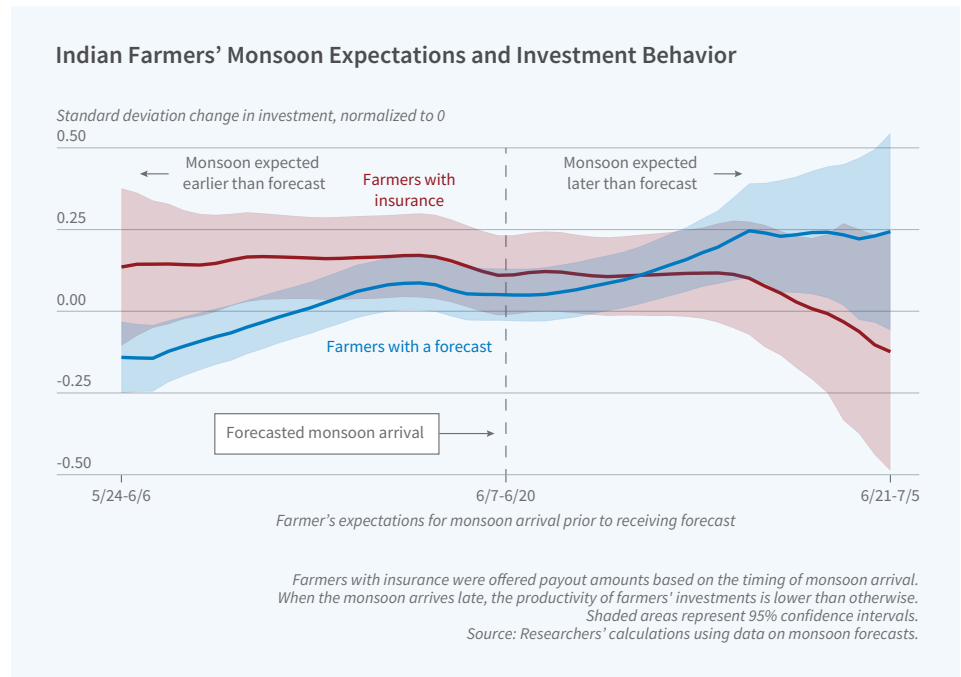
—Emma Salomon

Weather Forecasts and Farming Practices in India

Climate change is making weather patterns around the world more volatile, increasing risks for farmers. Providing farmers with accurate weather forecasts is one possible strategy for mitigating these risks. In [Long-Range Forecasts as Climate Adaptation: Experimental Evidence from Developing-Country Agriculture](#) (NBER Working Paper 32173), [Fiona Burlig](#), [Amir Jina](#), [Erin M. Kelley](#), [Gregory Lane](#), and [Harshil Sahai](#) report on a randomized trial in Indian villages that provided some farmers with a forecast of when the annual monsoon would begin. Farmers respond to news about monsoon timing by altering their production and investment choices.

Agriculture in the southern Indian state of Telangana, where the average landholding is 1 hectare, is dependent on the monsoon, which provides 80 percent of total annual rainfall. The timing of the start of the monsoon is highly variable from year to year. Early arrival of the monsoon is favorable for agricultural productivity. Traditionally, farmers rely on other farmers for weather information; there exists no official forecast of the monsoon's onset in the state. At baseline, farmers' prior beliefs about monsoon onset timing varied widely, with more optimistic farmers expecting the monsoon to arrive more than 2.5 weeks earlier than more pessimistic farmers.

The researchers randomized 250 villages in Telangana, sampling 5 to 10 farmers in each village, into a forecast group, an insurance group, and a control group. Farmers in the forecast group were offered an accurate forecast of the timing of the monsoon's onset, delivered 4–6 weeks in advance of the monsoon's arrival. Farmers in the insurance group were offered fully subsidized insurance against the monsoon onset date: they would receive no payout if the monsoon began less than two weeks later than usual, a small payout if it was 15–19 days late, a medium payout if it was 20–29 days late, and a large payout if it was 30 or



more days late.

The forecast caused farmers to update their beliefs, bringing their expectations about the growing season more in line with the forecast. This also led to changes in their planting behavior.

Though all farmers received the same forecast, the researchers find that the farmers' responses to this information differed depending on their prior beliefs. Optimistic farmers who had originally expected an early monsoon — and for whom the forecast provided “bad news” — reduced land under cultivation by 22 percent, were 32 percent less likely to add a crop type, and reduced agricultural expenditures by 10 percent. In contrast, pessimistic farmers who had originally expected a late monsoon — and therefore received “good news” from the forecast — increased land under cultivation by 15 percent, were 40 percent more likely to add new crops, and increased agricultural expenditures by 34 percent.

At the end of the growing season, while “bad news” farmers saw lower farm profits than the control group (in keeping with their reduced investments in agriculture), they shifted into nonag-

ricultural production, increasing non-agricultural investment by 12 percent and nonagricultural business profits by 47 percent. Their overall savings (net of debt) increased by \$560 per farmer. There was no change in agricultural profits for farmers who received good news, as higher spending on inputs canceled out the gains from increasing land under cultivation.

Insurance also caused farmers to change their behavior. In contrast to the forecast group, however, with insurance, pessimistic farmers did nothing, while optimistic farmers drove large positive impacts on land under cultivation and input expenditures. Forecasts and insurance work in different ways: forecasts provide information, allowing farmers to tailor their investments to the coming season, while insurance protects against downside risk.

In light of their findings that farmers adjust their behavior in response to forecasts, the researchers conclude that “long-range monsoon forecasts are a promising technology for helping farmers cope with increasing agricultural risks in a changing climate.”

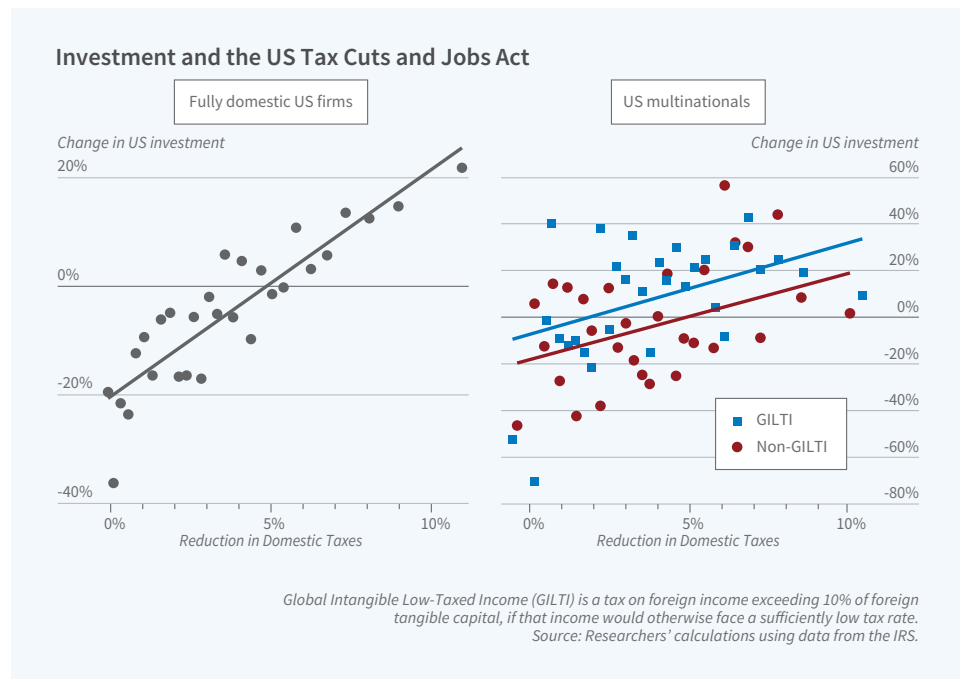
— Whitney Zhang

Investment Effects of the 2017 Tax Cuts and Jobs Act

The Tax Cuts and Jobs Act (TCJA) of 2017 was the most significant reform to corporate taxation in the US in nearly four decades. It reduced the top corporate income tax rate from 35 to 21 percent, increased investment incentives by making equipment investment fully tax-deductible, and changed the tax treatment of US businesses' overseas income. The various changes in tax rules affected different firms in different ways, creating cross-firm heterogeneity in the net effect on investment incentives. In [Tax Policy and Investment in a Global Economy](#) (NBER Working Paper 32180), [Gabriel Chodorow-Reich](#), [Matthew Smith](#), [Owen Zidar](#), and [Eric Zwick](#) use firm-level data on tax returns to study how the legislation affected both the domestic and foreign investment of US firms.

The researchers analyze tax return data on C corporations headquartered in the US for the period 2011–2019. This means that they are studying investment responses in the first two years after the tax reform. Different firms had different exposure to the reforms embodied in the TCJA because of differences in their taxable income and the level and composition of their investment spending. For example, since the TCJA increased the incentives to invest in equipment more than it increased the incentives to invest in structures, the researchers treat firms that historically invested more on equipment than structures as receiving a larger boost to investment incentives. Similarly, the reduction in the statutory corporate tax rate did increase incentives for tax-paying firms, but the increase was smaller for firms that were not paying taxes at the time because of low levels of taxable income or because of other tax credits they got prior to the reform.

The researchers exploit the cross-firm variation to estimate the responsiveness of corporate investment to key features of the tax reform. They compare firms for which the net-of-tax cost of new domestic investment changed by more and by less after



2017, as well as firms with larger and smaller changes in the cost of foreign capital investments, and larger and smaller changes in their marginal tax rate on earnings. They document significant declines in the average net cost of new investment, both for investments in the US and for investments abroad. They estimate that a 1 percent decline in the effective cost of new domestic capital goods raises domestic investment spending by about 3 percent, and a 1 percent decline in the cost of foreign capital investment also has a positive effect of about 0.6 percent. A 1 percent increase in the after-tax value of a dollar of taxable income is associated with an increase in investment of about 3.8 percent. To summarize these different effects, the researchers report that the TCJA increased domestic investment in the short run by about 20 percent for a firm with an average-sized tax shock versus a no reform baseline. The estimated domestic investment increase is larger for multinational firms that also benefited from the foreign investment incentives in the TCJA, suggesting complementarity between domestic and foreign capital.

The researchers note that they have only two years of post-TCJA data with

which to estimate the law's effect on firm investment, and the law's impact on corporate tax revenues will depend on its longer-run impact on the corporate capital stock and on wages. In addition, if all firms in the economy move to increase investment at the same time, crowding out at the macroeconomic level will offset the relative increase they observe in the data. To address this issue, they use their estimated short-run effects to calibrate a model of long-term capital investment and wage determination. They predict a long-run capital stock increase of 7.2 percent and a 0.9 percent increase in wages after 15 years.

When it was enacted, the TCJA was estimated to reduce corporate tax revenues by between \$100 and \$150 billion per year over the 2018–2027 period. The researchers find that the increased investment and wages resulting from the law have very limited effects on receipts from the corporate income tax or other revenue sources, such as the payroll tax and income tax. They conclude that such indirect effects do not substantially offset the decline in domestic corporate tax revenue of about 40 percent over the 10-year budget window.

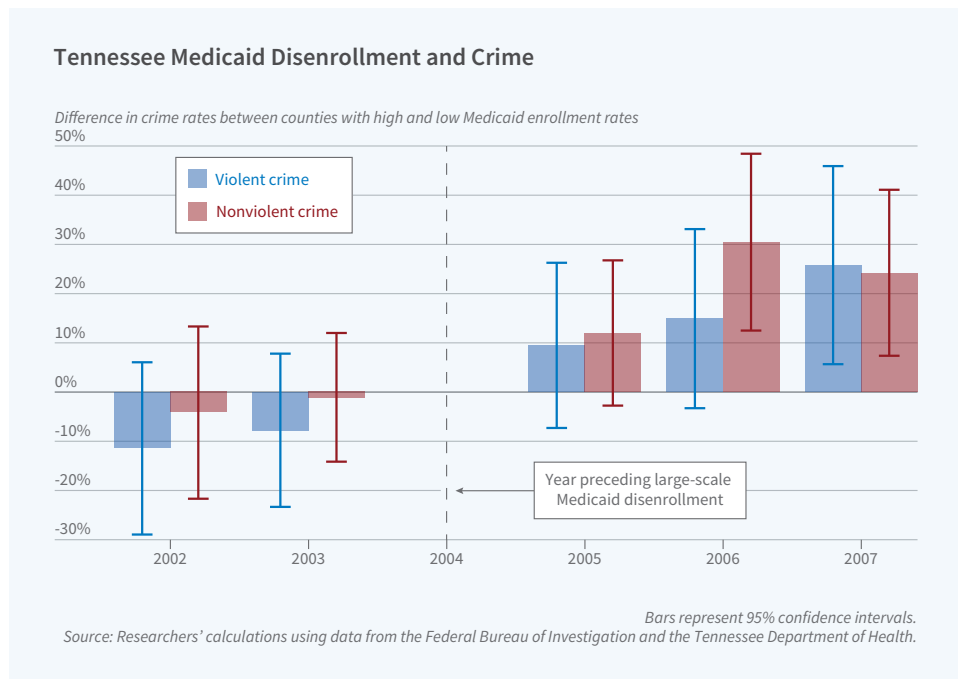
—Shakked Noy

Reduced Medicaid Access, Increased Crime

In 1993, Tennessee launched TennCare, a program that expanded traditional Medicaid coverage to include low-income adults who were childless and not disabled or elderly. The program offered low-cost preventative and diagnostic services, prescriptions, and, importantly, behavioral and alcohol and drug use rehabilitation services. By late 2004, TennCare covered a quarter of the state's residents, and its adult Medicaid participation rate was the highest in the nation. The program consumed 30 percent of the state budget, and it was deemed unsustainable and discontinued in 2005. Over the remainder of that year, 10 percent of the state's Medicaid enrollees — 3 percent of the state's population — were cut from the rolls.

In [Losing Medicaid and Crime](#) (NBER Working Paper 32227), [Monica Deza](#), [Thanh Lu](#), [Johanna Catherine Maclean](#), and [Alberto Ortega](#) study the consequence of this policy change for criminal activity. They note that most of the 190,000 individuals who were disenrolled from Medicaid were in the demographic category most prone to criminal activity.

The researchers compared counties in Tennessee where many people lost Medicaid coverage after 2005 to counties where fewer people lost coverage. They looked at crime rate trends before and after 2005 in counties with larger and smaller numbers of people losing Medicaid. The key assumption is that if not for people losing Medicaid, the crime trends would have continued similarly across Tennessee counties after 2005. The researchers attribute any divergence in crime rates between Tennessee counties after 2005 to the differences in the number of people losing Medicaid access as a result of the policy change.



The researchers summarize their findings by describing the policy's impact on a county with median exposure to disenrollment, namely one where 25.8 percent of the population was covered by Medicaid prior to 2005. They estimate that following disenrollment, such a county would experience an increase in violent crime of 20.6 percent and a rise in nonviolent crime of 14.1 percent per year. Those percentages translate to 65 additional violent crimes and 71 additional nonviolent crimes. Assaults were the main drivers of the increase in violent crimes, and theft was the driver of higher nonviolent crime, based on monthly data from the FBI's Uniform Crime Reporting for 2002–07.

The researchers suggest that termination of substance use disorder treatment played a crucial role in the increases. Using mortality rates as an indicator of substance use, they find that the median-exposure county expe-

rienced a 25 percent increase in drug overdose deaths following TennCare disenrollment. Rates of alcohol-related deaths and deaths by suicide did not rise significantly. The disenrollment roughly coincided with the initial wave of the opioid crisis; fatal opioid overdoses in Tennessee were above the national average.

Missouri also cut its Medicaid rolls in 2005, but the reduction fell on a demographic less likely to commit crimes. While Tennessee disenrolled childless adults who were not disabled or elderly, Missouri tightened income thresholds on traditional Medicaid beneficiaries: working parents, people with disabilities, and seniors. Applying a similar analysis as in the Tennessee study, the researchers found that even though Missouri disenrolled 100,000 people, the impact on crime was generally not statistically significant.

—Steve Maas

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