advantage

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Free trade, drugs and violence in Mexico

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Welcome ...

In this issue we explore the challenge of designing policies that work in the real world. And the importance of understanding how people respond to them.

Badly designed policy can have unintended negative consequences. In leaving the EU, many policymakers hoped that UK trade could be released from unnecessary regulation, and this would boost the economy. But Jan Bakker et al. show that so far new trade arrangements with the EU have increased non-tariff trade barriers, and this has pushed up food bills. Looking back into history, Eduardo Hidalgo et al. demonstrate the negative effects of another trade policy, the North American Free Trade Agreement. Their analysis indicates that the agreement led to an increase in drug-related homicides in Mexico.

Yet, carefully considered policy can have positive effects. In a study of the impact of mandatory work-based pensions in Switzerland, David Burgherr finds evidence that the policy has encouraged some employees to save more for retirement. Meanwhile, Anant Sudarshan explains findings from a first-of-its-kind emission market experiment in India, which suggest emissions trading could hold the key to low-carbon growth there. Both studies demonstrate how important it is to test and monitor policy frameworks to understand how people respond.

Implementing new policy doesn't necessarily mean people will comply. Our remaining two articles explore what happens when people try to work around new rules. Sascha O. Becker and Sharun Mukand explain how professional networks enabled Jewish academics to escape persecution in Nazi Germany following the introduction of racist policies in the 1930s. Mirko Draca meanwhile, takes us to Washington to reveal how firms are working around lobbying restrictions to lobby government from the shadows. Both articles showcase the power and adaptability of professional networks in responding to new regulations.

The need for agile policymaking — the ability to respond to unexpected shocks like energy price rises, in addition to long foreseen emergencies like climate change — has never been more obvious. In our Parting Shot, CAGE Impact Director Michael Waterson shares his expertise on the energy market, and highlights how recent energy policies have created conflicts for distributers, suppliers and consumers.

Stephanie Seavers, Editor

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Escaping persecution: The role of professional networks

By Sascha O. Becker and Sharun Mukand

"Growing persecution and the threat of deportation to camps left many Jewish academics rushing to escape the country."

In 1933, the Nazi party passed a law to 'retire' academics and other civil servants of Jewish descent from their positions. In the scramble to escape growing persecution, many academics of Jewish heritage turned to former colleagues for help.

When the Nazi regime came to power in 1933, the flourishing academic culture established in Germany came to a sudden halt. Jewish academics were targeted through demonstrations, class boycotts and sporadic violence. Mass dismissal of Jews (defined by the Nazis as individuals with at least one Jewish grandparent) from academic positions began in 1933. By 1939 virtually all Jewish academics had lost their jobs.

Growing persecution and the threat of deportation to camps left many Jewish academics rushing to escape the country. But successful emigration was not a foregone conclusion. Jobs outside Germany were scarce after the Great Depression and anti-Semitism was rife. The majority of Jewish academics *did* successfully flee Germany to positions in other countries. But how did they do it? ▶

The case of Richard Courant gives us some insight. Courant was a world-leading mathematician at the University of Göttingen. He emigrated to Cambridge in 1933 before moving to New York University the year after. Courant received letters 'by the dozens' asking for help from mathematicians seeking to flee Germany. Figure 1 shows how he supported some of his former colleagues in finding work in the US.

The case of Richard Courant suggests that professional networks could be highly successful in helping academics to find work outside Germany. But Courant's success in securing positions for his colleagues may also have been due to his world-renown.

Did professional networks play a role in enabling other academics to escape?

To understand how networks enabled escape from Nazi Germany, we compiled a list of all 1370 dismissed Jewish academics. We used the List of Displaced German Scholars alongside university-specific data and subject-specific studies.

We then constructed detailed biographies and career paths for each academic using archival and digital resources. From there we were able to set out the professional networks of each academic.

We considered academics who had worked together between the years 1929 and 1933 to be part of a network. We specifically looked at the years before the dismissals began, so that the networks studied were genuine professional connections rather than associations created for the specific purpose of escape.

The dismissal of Jewish academics took place over a number of years. At first, individuals who had fought in the First World War, had lost a father or son in the war or had worked for the civil service since 1914 were exempt from dismissal. In 1935 these exemptions were revoked.

The two-stage nature of the dismissal of Jewish academics allows us to consider the impact of early émigrés (those who had been dismissed and had emigrated by 1935) on the emigration decisions of colleagues who were still in Germany in 1935.

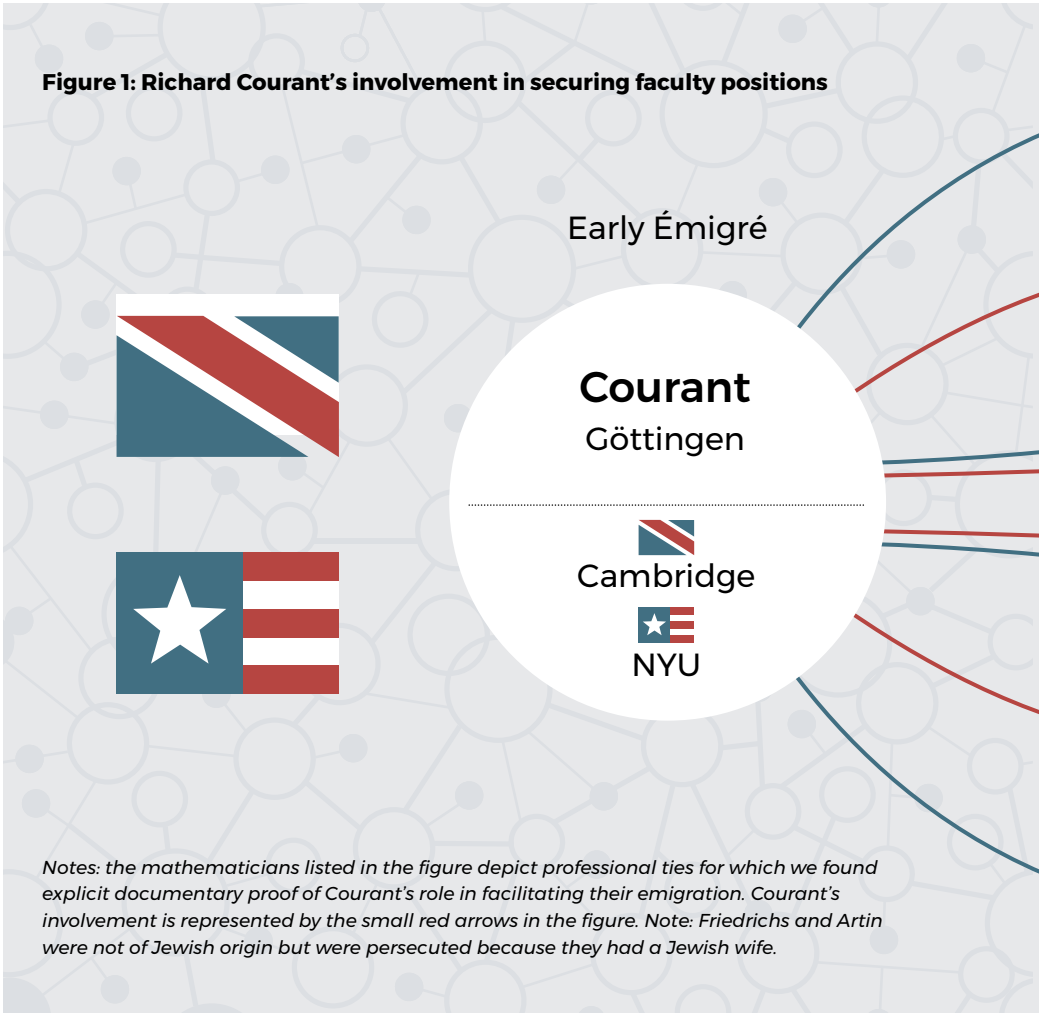
We find that those academics who had links to early émigrés were more likely to emigrate themselves. Academics with ten or more ties to early émigrés were five percentage points more likely to emigrate by 1939. Our findings control for variables which could impact the likelihood of emigration including family, languages spoken and academic seniority.

Academics with links to early émigrés were also more likely to move to the location in which the early émigré had settled. This suggests that émigrés were able to use their knowledge and influence in their new location to support their colleagues to move.

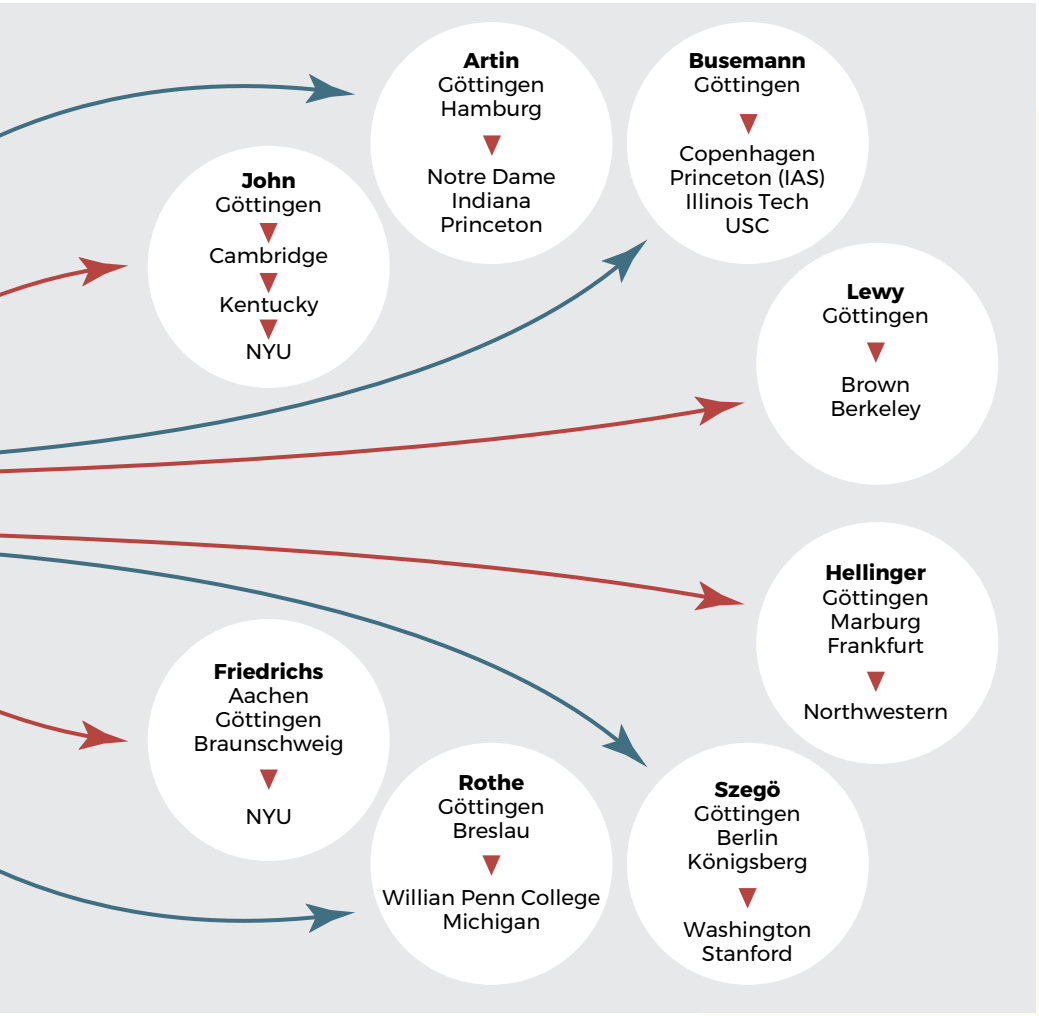
There is evidence to suggest that early émigrés only affected the emigration decisions of those who had not left Germany by 1935, indicating that émigrés had to be settled into a new location before they could effectively support others to escape.

We find that professional network ties were much stronger and more effective if the connection was recent and local. Academics with ten or more ties to recent colleagues (those they had worked with in either 1932 or 1933) were eight percentage points more likely to emigrate. Older connections were less likely to facilitate emigration.

Figure 1: Richard Courant's involvement in securing faculty positions



Notes: the mathematicians listed in the figure depict professional ties for which we found explicit documentary proof of Courant's role in facilitating their emigration. Courant's involvement is represented by the small red arrows in the figure. Note: Friedrichs and Artin were not of Jewish origin but were persecuted because they had a Jewish wife.



We found similar trends for geographical proximity. Academics with ten or more ties to early émigrés who had worked at the same department were six percentage points more likely to emigrate. Academics with ties to émigrés who taught the same subject at a different university in the town were five percentage points more likely to emigrate.

This finding is surprising given the life-or-death implications of emigrating during this period. It suggests that the strength of networks can decay over time and space, something that has not been observed before.

Among the cohort of academics who emigrated, none of them made use of community networks to leave the country. This is in contrast to low-skilled migrants, who have been found in previous studies of migration to rely on community and family networks.

Academic emigration was much higher than for ordinary Jews. Most academics were able to leave the country safely, but by 1945 only 51% of the general Jewish population had left Germany. Professional networks were therefore potentially significant for high-skilled workers in opening up opportunities for escape that were not available to everyone.

Our findings suggest that even short-term interruptions to or surges of high-skilled migration can have long-term implications for the flow of high-skilled workers to a country. Policymakers should consider this when designing immigration policy for high-skilled workers. ◀

"We find that professional network ties were much stronger and more effective if the connection was recent and local."

51%

PERCENTAGE OF THE GENERAL JEWISH POPULATION WHO HAD LEFT GERMANY BY 1945

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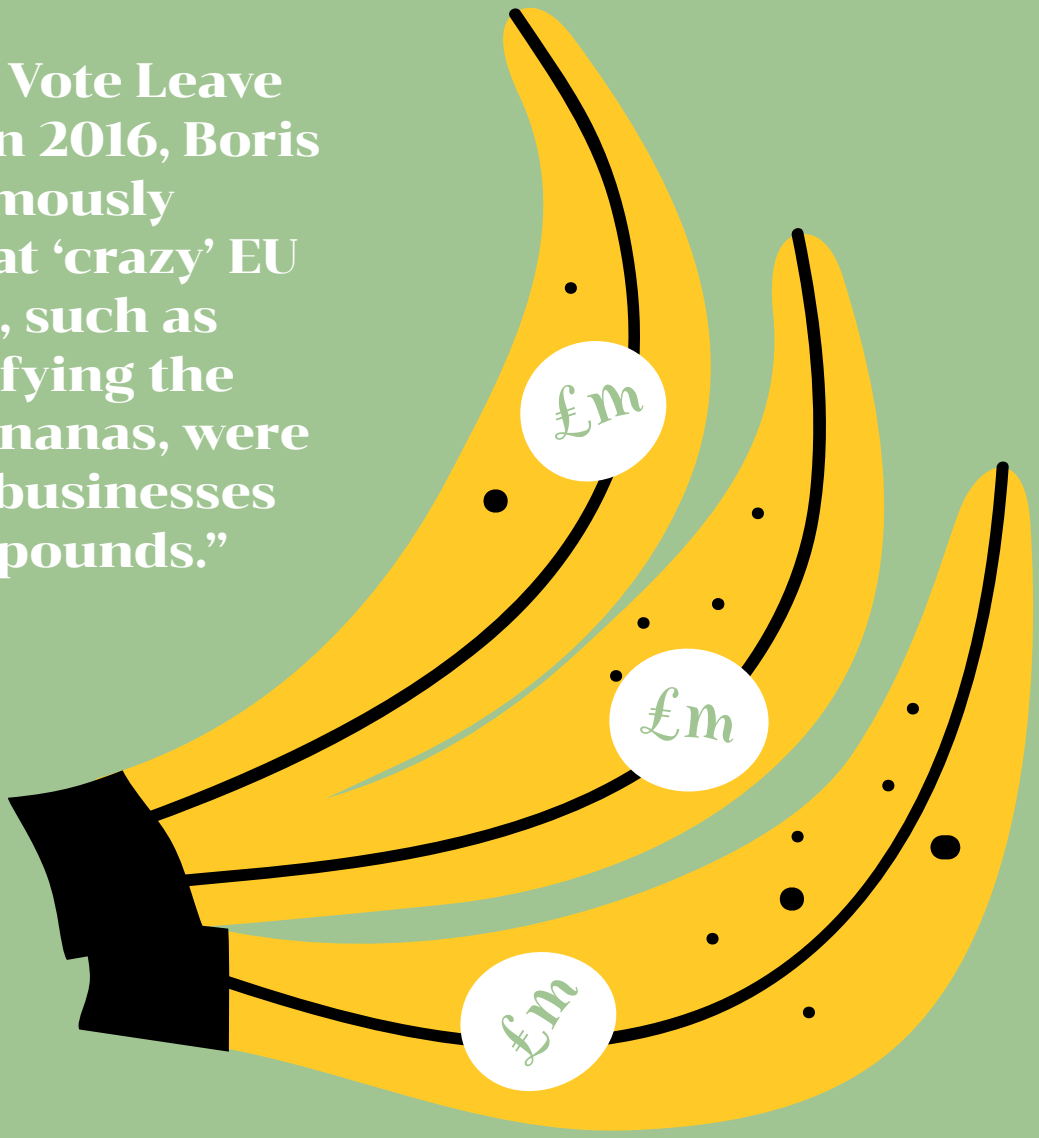
Publication details

Becker, S., Mukand, S., Lindenthal, V., Waldinger, F. (2022) Persecution and escape: Professional networks and high-skilled emmigration from Nazi Germany. CAGE Working Paper (no. 542).

"During the Vote Leave campaign in 2016, Boris Johnson famously asserted that 'crazy' EU regulations, such as those classifying the shape of bananas, were costing UK businesses millions of pounds."



How post-Brexit trade has driven up food bills

By Jan David Bakker, Nikhil Datta, Richard Davies and Josh De Lyon

Consumers paid an extra £210 on average on their food bills between 2020 and 2021. The reason is an important, but little-discussed, area of trade policy: non-tariff trade barriers.

During the Vote Leave campaign in 2016, Boris Johnson famously asserted that 'crazy' EU regulations, such as those classifying the shape of bananas, were costing UK businesses millions of pounds. The claims were mostly rhetoric, but the message was powerful. Leaving the EU would free the UK from unnecessary trade regulation. And freer trade would be good for the UK economy.

Our recent analysis shows it hasn't quite worked out like that yet. In fact, trade post-Brexit has increased consumer prices of food items in the UK. We find that food prices increased by around 6% due to Brexit, which added an average £210 onto household food bills — costing consumers £5.8 billion across the UK between 2020 and 2021.

Our analysis also identifies the reason for these rising costs: non-tariff trade barriers.

Non-tariff trade barriers, or NTBs, are an important aspect of trade policy, not often discussed in public debate. An NTB is any measure, apart from a customs tariff, that acts as a barrier to trade. These could be, for example, regulations on how a product is handled, rules requiring proof about where goods came from, or checks and inspections at the border.

While trade tariffs generate government revenue, NTBs can be an important tool for protecting public health or the environment — for example through requiring imported goods to abide by the same environmental standards as those produced domestically.

When Britain was part of the EU, it benefited not only from fewer trade tariffs but also from few internal trade barriers. NTBs were avoided through the mutual recognition of standards. For example, while a steak of beef imported to the UK from France was not checked for public health certificates at the border, a steak imported from Algeria was.

Since January 2021, when Britain officially left the EU, the trade relationship between the EU and the UK has been governed by the Trade and Cooperation Agreement (TCA). This agreement ensures that trade between the two areas remains tariff free. But because the UK wanted the option to increase its independence from EU regulation and trade policy, the TCA contains very limited provision for regulatory alignment between the two blocs. The consequence is a regulatory and customs border in the English Channel and an increase in NTBs between the UK and the EU.

We find that this rise in NTBs is directly responsible for a rise in consumer food prices after Brexit. The rise in prices was driven only by products with high NTBs and there was no statistically significant rise in prices for products with low NTBs. This suggests that EU exporters and UK importers face higher costs due to these new barriers, and we estimate that between 50% and 88% of these costs have been passed on to consumers.

It is true to say that while UK importers and EU exporters incur higher costs and UK consumers are hurt by higher prices, domestic UK producers benefit from the price increase. However, overall, this protectionist rise in NTBs has hurt the UK economy.

Our findings highlight the importance of developing trade policy that goes beyond simple tariff reductions and takes into account other potential barriers to trade. Reduction in trade tariffs does not automatically allow consumers to reap the benefits of lower prices. This is because NTBs account for a much larger share of trade policy costs in advanced economies. According to recent estimates (NTBs generate administrative and bureaucratic costs that are not directly observable so have to be estimated), the average ad valorem cost of NTBs in the European Union stands at 13.1% compared to 1.8% for tariffs.

As non-tariff barriers can be used to set environmental and other standards, there will be potential benefits to adjusting regulation unilaterally for the UK. But so far UK regulations have remained very similar to EU regulations, so these benefits have yet to be realised.

It is unclear whether there are any trade policy fields where the UK can benefit substantially from diverging from the EU regulatory framework. The UK may decide to align its regulatory framework with another major trading bloc such as the United States. This would significantly lower trade costs with, and reduce the cost of goods imported from, the US.

But for now, UK consumers will have to get used to higher food bills. ◀

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Publication details

By Bakker, J.D, Datta, N., Davies, R., and De Lyon, J. (2022). Non-tariff barriers and consumer prices: evidence from Brexit. CEP Discussion Paper (no.1888).

A push in the right direction: Are mandatory pension contributions boosting retirement savings?

By David Burgherr

Many countries have tried to boost retirement savings by making workers contribute to workplace pension schemes. But are these measures effective? New evidence shows mandatory pension contributions have had a surprising effect on workers' voluntary pension contributions.

Ageing populations and rising life expectancies have raised concerns that people are saving too little to maintain an adequate standard of living in retirement. To improve people's financial preparedness for old age, governments in many countries have introduced policies aimed at boosting pension savings.

One of the most promising measures is to make workers contribute to an employer-sponsored pension account that they can only withdraw funds from after retirement. Often this is achieved by firms automatically enrolling new hires in work pension plans unless they actively choose to opt out. In the UK, employees earning more than £10,000 per year are automatically enrolled in a workplace pension scheme. In the US, the SECURE 2.0 Act of 2022 introduced similar rules.

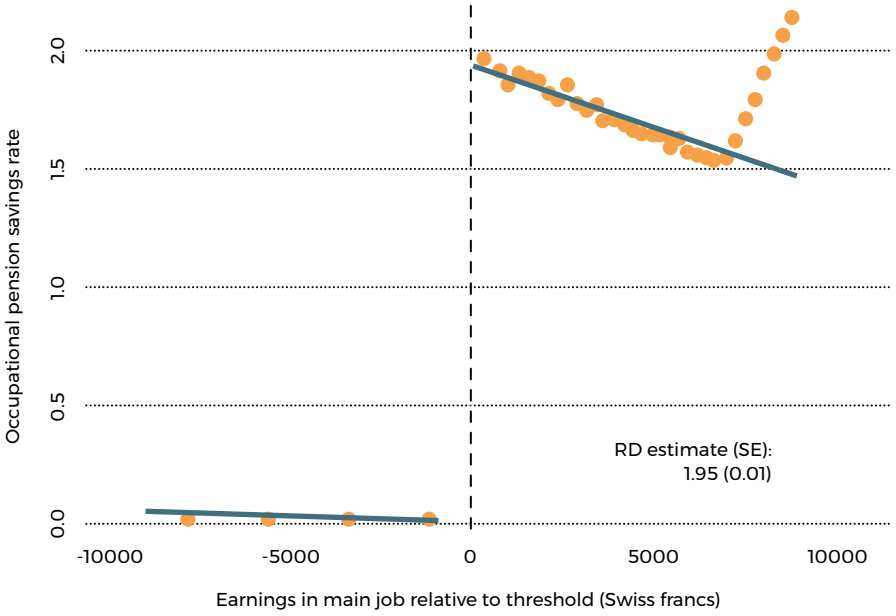
Policies nudging or even forcing workers to contribute to occupational pension plans have proven effective at raising pension participation. But whether these policies succeed in boosting retirement savings depends on how mandatory saving affects people's decisions to make voluntary pension contributions. If people use mandatory occupational pensions *instead* of voluntary pension schemes, they will ultimately be no better off. So, do state mandates and nudges crowd out private action?

I study the saving responses to the occupational pension mandate in Switzerland. Employees earning more than around 22,000 Swiss francs (roughly £20,000) are required to contribute a chunk of their salary to an employer-sponsored pension account.

In contrast to automatic enrolment, the mandate is binding; people above the earnings threshold cannot opt out. Contributions are calculated by multiplying qualifying earnings by the age-specific (minimum) contribution rate.

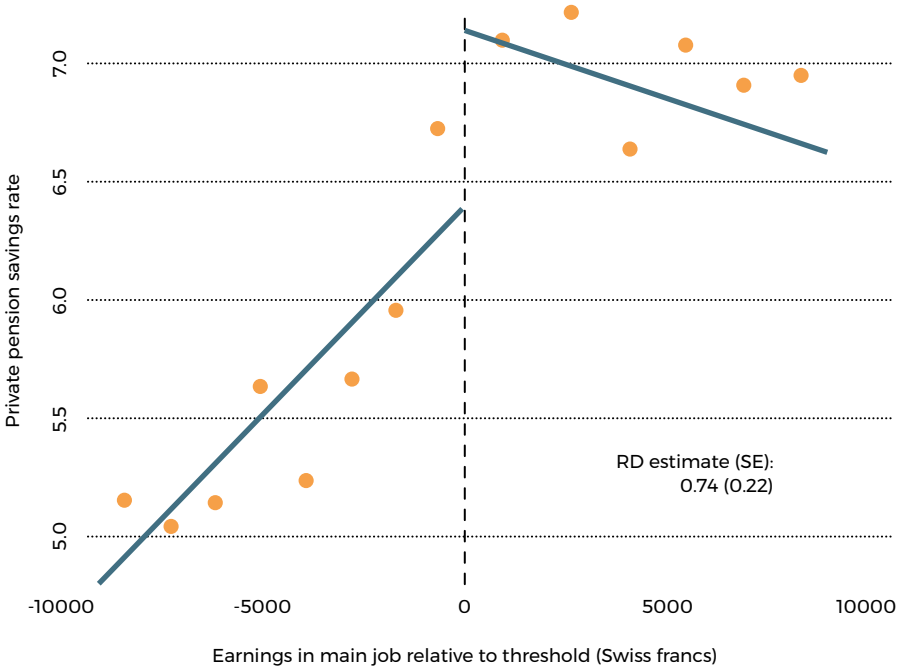
Swiss law sets a lower limit for mandated contributions that varies

Figure 1: The mandate increases the occupational pension savings rate by 2 percentage points



Notes: Effect of the occupational pension mandate on occupational pension savings rates in 2017. Points are local sample means. Solid lines are linear fits estimated separately on each side of the cut-off. The earnings variable on the x-axis is recentred around the mandate threshold of 21,150 Swiss francs, indicated by the dashed vertical line.

Figure 2: Voluntary private pension savings jump up at the mandate threshold



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"Mandatory pension plan enrolment has the potential to directly affect not only how much people save for retirement but also their attitudes and awareness of saving options."

with workers' age. For example, a 45-year-old worker qualifying for the mandate must contribute at least 550 Swiss francs per year to their workplace pension. This means workers just above the earnings threshold have to contribute a significant sum to their occupational pension pot while those just below do not. This provides a great quasi-experiment to study saving responses. For workers just above and just below the earnings threshold, it is as good as random whether they are subject to the mandate or not. Comparing similar workers in these two groups allows me to understand the causal effect of the policy.

While automatic enrolment is a relatively recent trend, the Swiss mandate was introduced back in 1985 so there are decades of experience to draw on. I use de-identified tax microdata on income, wealth and savings covering the full population in one of the largest Swiss cantons, Bern. I can measure different types of pension savings and private savings, enabling me to comprehensively track the saving responses to the mandate.

Figure 1 shows that workers above the cut-off contribute on average around 2% of their salary (about 400 Swiss francs per year) to an occupational pension account.

How do these workers adjust their other savings in response?

Figure 2 documents that they raise their voluntary pension savings rate in tax-deductible accounts by 0.7 percentage points — a relative increase of about 12%.

I also find a smaller but significant increase in voluntary lump-sum contributions to occupational pension accounts.

Workers appear to lower their private savings in assets not earmarked for retirement, such as bank accounts, securities, or property, by the same amount as their pension savings increase. This suggests that total savings are unchanged. However, statistically I cannot rule out that the mandate had no effect on private savings so conclusions about total savings should be taken with a grain of salt.

Given that occupational and private pension accounts have very similar features, it seems surprising that the occupational pension mandate crowds in voluntary retirement savings. To test these findings and investigate the underlying mechanisms, I study the 2005 reform of the occupational pension system that lowered the earnings threshold for the mandate substantially, roughly from 25,000 to 19,000 Swiss francs.

Comparing workers newly covered by the mandate to those close to the cut-off but still not subject to it after the reform over time, I find very consistent results.

Exploring mechanisms, the positive impact on voluntary pension savings turns out to be completely driven by workers who had not contributed to private pension accounts before the reform. This suggests that the reform particularly encouraged people to save for retirement who had not previously been aware of the importance and advantages of contributing to pension pots.

Being enrolled in an occupational pension plan due to the mandate could have achieved this by providing information about the need to save for retirement, the saving vehicles available for doing so, and the tax benefits associated with them, as well as by boosting salience of the pension system.

However, I find that only workers in high-income households, who are likely secondary earners, respond by increasing voluntary pension savings. Individuals who are more likely to live hand to mouth because they do not have other sources of income or a partner who is earning more reduce voluntary pension savings once they are forced to contribute to an occupational pension pot.

To assess whether pension policies boost retirement savings in the long run, researchers need data tracking workers' saving decisions over their entire careers. For most countries we don't yet have data spanning such a long period.

Nevertheless, the evidence from Switzerland is suggestive. It shows that mandatory pension plan enrolment has the potential to directly affect not only how much people save for retirement but also their attitudes and awareness of saving options.

This implies that governments could do more to prepare people for retirement by enhancing financial literacy, improving knowledge about the pension system, and motivating people to develop a financial plan for old age. ◀

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Publication details

Burgherr, D. (2022). Behavioral Responses to a Pension Savings Mandate: Quasi-experimental Evidence from Swiss Tax Data. CAGE Working Paper (no. 645).

Political influencers: Does the US have a handle on lobbying activity?

By Mirko Draca

Unregistered or 'shadow' lobbying is a booming business, and it's threatening the transparency of US law making.

The lobbying of government by special interest groups is legal in the US — and as an industry, it's thriving. Spending on registered lobbying activity rose by 68% between 1998 and 2013, from $1.9 billion to $3.2 billion.

To maintain the integrity of the democratic process, US law requires lobbying activity to be registered according to the Lobbying Disclosure Act (LDA, 1995). But in recent years critics have called out a lack of transparency. Donald Trump in his 2016 presidential campaign, for example, included a battle cry to 'drain the swamp' of shadow lobbyists (only to come under criticism during his Presidency over claims his staff were involved in shadow lobbying).

But is shadow lobbying a regular practice in US politics? And if so, what is the scale of the issue?

The LDA defines lobbyists as people who have than one lobbying contact, are paid for their work and spend more than 20% of their time lobbying. Workers who meet this definition must report their meetings and activities every three months to the Government Audit Office.

To find out just how much lobbying is done off the books, we monitor politicians and staffers leaving congressional posts and joining firms with lobbying practices between 1998 and 2012. From this group, we compare 'shadow lobbyists' (those who do not register as lobbyists) with officially registered lobbyists to measure their effects on firm revenue. We use data from lobbying reports, congressional staff databases and firm revenues.

We find that shadow lobbyists account for $149 million dollars in additional firm revenue across the sector: a 6.4% revenue boost. Firms can expect a 10–20% increase in revenue for each shadow lobbyist they hire. This revenue uplift is equivalent to hiring one full time mid-level registered lobbyist.

It's hard to reconcile that 20% of one shadow lobbyist is as effective as 100% of a registered lobbyist. The evidence strongly suggests that shadow lobbyists are spending more than 20% of their time on lobbying activities.

The data shows that shadow lobbyists are concentrated in large firms with more than ten registered lobbyists, where it is easier for them to leverage their contacts and experience — or hide their activity. Around 40% of shadow lobbyists work for these large firms, which make up just 129 out of 4600 businesses in the industry. ▶

We find that both shadow lobbyists and registered lobbyists have risen across the period, but shadow lobbyists have particularly grown since 2008 (Figure 1). A possible reason for this shift is that in 2007 the Honest Leadership and Open Government Act required congressional staffers to wait 12–24 months before they could take up a lobbying position. Similar restrictions were put in place for people with lobbying experience wishing to take up a position in the Administration. This may have deterred some lobbyists from officially registering their activity.

Revenue growth is concentrated among firms who hire shadow lobbyists. By the end of the period we study, firms with shadow lobbyists are taking on $5–6millon — double that of firms with no shadow lobbyists. There are lots of possible reasons for this gap. We estimate that about 7% of the gap can be explained by the growth of shadow lobbyists.

The evidence suggests that the LDA is not effective in ensuring that lobbying activity is fully recorded. The 20% lobbying boundary is a self-reported measure that cannot easily be checked and verified. In fact, in a report in 2015, the Government Audit Office said that it was not obliged to monitor rule breaking or to seek out evidence of shadow lobbying. As a result, individuals can avoid registering as a lobbyist without fear of reprisal.

It is worth noting that our evidence for shadow lobbying may only be the tip of the iceberg. Our data does not cover organisations that do not have a lobbying practice, such as think tanks. There may be many more unregistered ex-congressional staff lobbying in organisations like these.

As lobbying continues to drive big business revenue in the US, better monitoring through the LDA will be essential to keep US political decision-making transparent. ◀

“It is worth noting that our evidence for shadow lobbying may only be the tip of the iceberg.”

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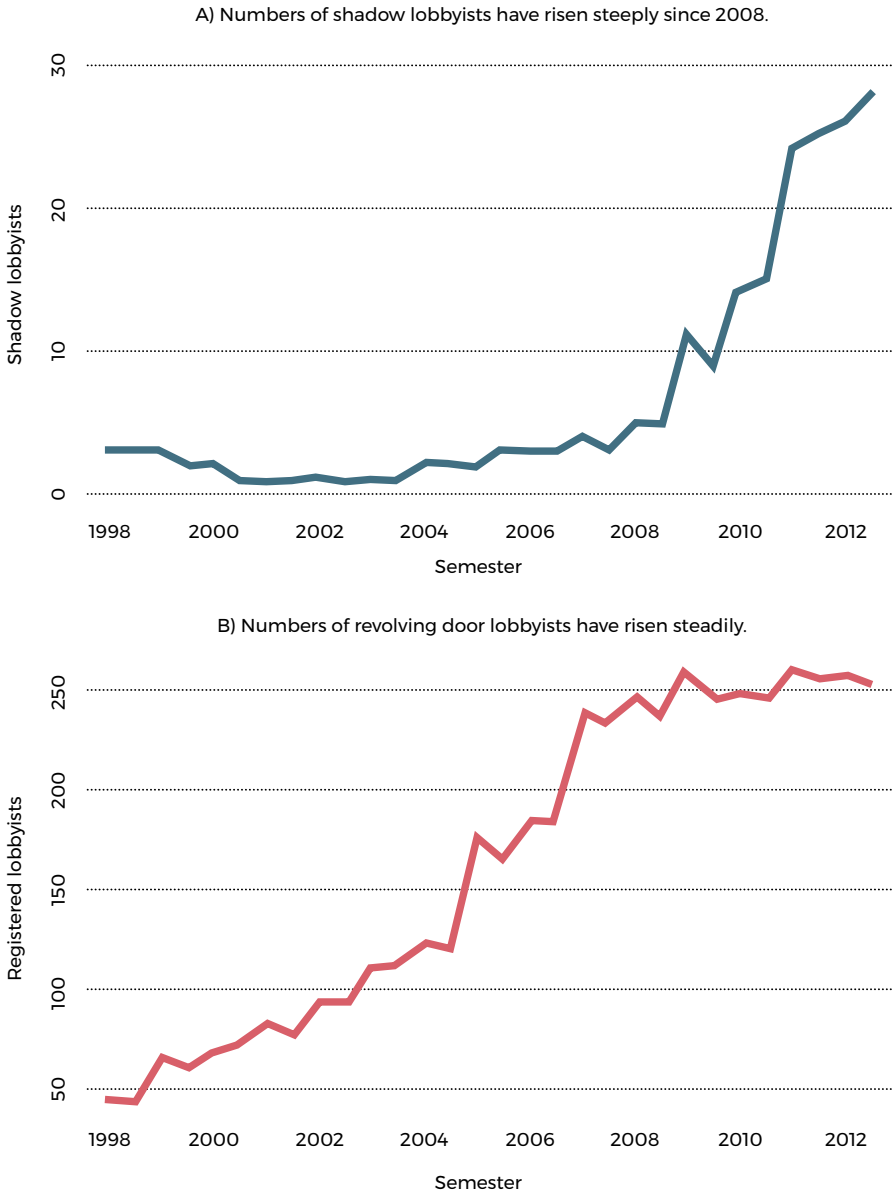
Publication details

d’Este, R., Draca, M., Fons-Rosen C. (2023). Shadow lobbyists. CAGE Working Paper (no. 652).

Figure 1: Numbers of lobbyists have risen between 1998 and 2012



Note: 'Revolving door lobbyists' are registered lobbyists who have previously held staff positions in the US Congress.

Free trade, drugs and violence

By Eduardo Hidalgo, Erik Hornung and Pablo Selaya

The North American Free Trade Agreement (NAFTA, 1994) relaxed trade restrictions between the United States, Canada and Mexico. But the agreement also brought about an unintended consequence – a surge in drug-related violence in Mexico.

In 1994, NAFTA reduced or eliminated tariffs on imports and exports between the US, Canada and Mexico, creating a massive free-trade zone. The deal was economically beneficial for Mexico in many ways. The looser terms of trade led to a doubling of exports to the US as a percentage of GDP (Gross Domestic Product).

But the free trade agreement also opened up new opportunities for the illegal cocaine trade. From the mid-1980s Mexican drug-trafficking organisations had offered services to cartels in Colombia to transport cocaine overland and across the US border. NAFTA increased the profits of these organisations by making trafficking routes much less risky.

Between 1993 and 1996 the number of cargo trucks crossing the Mexican US border increased by 1.6 million, while the US border control inspection rate fell. In other words, the risk of being caught trafficking cocaine plummeted, turning the Mexican border into a prime gateway to the US for drug traffickers. We believe that the profits from smuggling a kilogram of cocaine into the US increased by as much as 75%.

This increased profits in the Mexican drug-trafficking sector and, by consequence, the value of controlling it. Enticed to capitalise on this newly lucrative opportunity, Mexican traffickers, backed by Colombian drug lords, raced to take control of the most valuable drug trafficking routes.

The effect changed the geography of violence in Mexico. We compare the changes in drug-related homicides after NAFTA's introduction across municipalities with and without drug-trafficking routes.

We predict potential trafficking routes by estimating optimal routes between points of entry into the US and known areas of drug production and drug trafficking in Mexico before NAFTA. Using municipal-level panel data, we then measure changes in male homicides between the age of 15 and 39 in regions along these routes.

"We find that Mexican regions on drug trafficking routes saw a disproportionate rise in violence after the introduction of NAFTA."

We find that Mexican regions on drug trafficking routes saw a disproportionate rise in violence after the introduction of NAFTA. The proportion of homicides per 100,000 residents rose by 27% along these routes.

The results also show a positive association between the length of routes within a municipality and drug-related homicides, suggesting that violence was concentrated in municipalities with longer segments of trafficking routes.

Our analysis finds that changes emerge only after 1994, whereas trends in drug-related homicides did not differ across municipalities with and without drug-trafficking routes before NAFTA was introduced.

We are also able to show that the introduction of NAFTA is not associated with any changes in homicides of demographics not typically involved in the trafficking business, such as females and older people. Other causes of death, such as suicides and traffic fatalities are also unaffected.

We can also rule out that these changes in drug-related violence were driven by other detrimental effects of the free trade agreement. For example, regions that predominantly produced maize, which arguably suffered the most from import competition after NAFTA, did not experience a rise in drug-related homicides. The same is true for regions strongly affected by import competition in manufacturing. These checks confirm that the estimated increase in drug-related homicides in municipalities with a predicted drug-trafficking route is triggered by NAFTA and is not confounded by the detrimental effects of import competition.

A decade after NAFTA, 90% of Colombian cocaine had been smuggled through the Southwest Mexican–US border. With massive wealth and power being accumulated by Mexican cartels and kingpins, like Sinaloa cartel leader Joaquín 'El Chapo' Guzmán, NAFTA's impact on violence and the global drug trade was indisputable.

The unintended negative consequences of NAFTA demonstrate the delicacy of designing trade policy. In 2020, NAFTA was scrapped by US congress and replaced with The United States-Mexico-Canada Agreement (USMCA) which places specific focus on upholding good anti-corruption laws and regulatory practices. ◀

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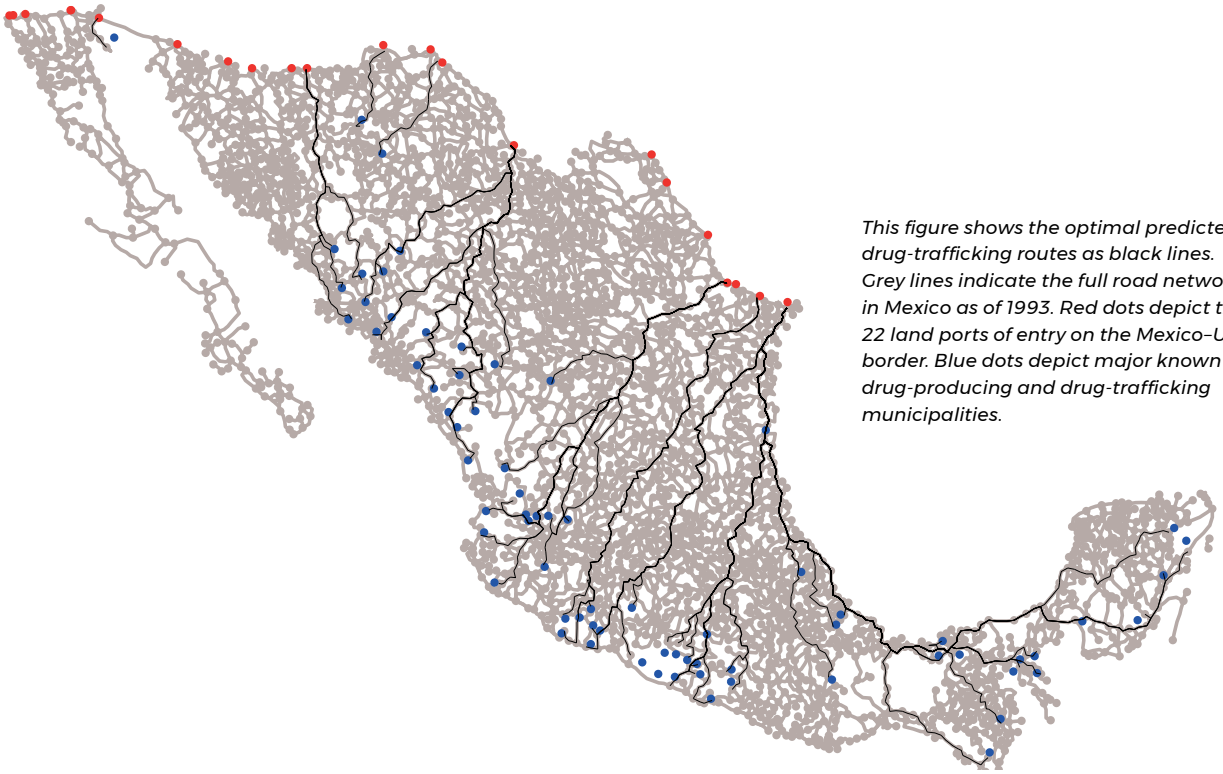
Publication details

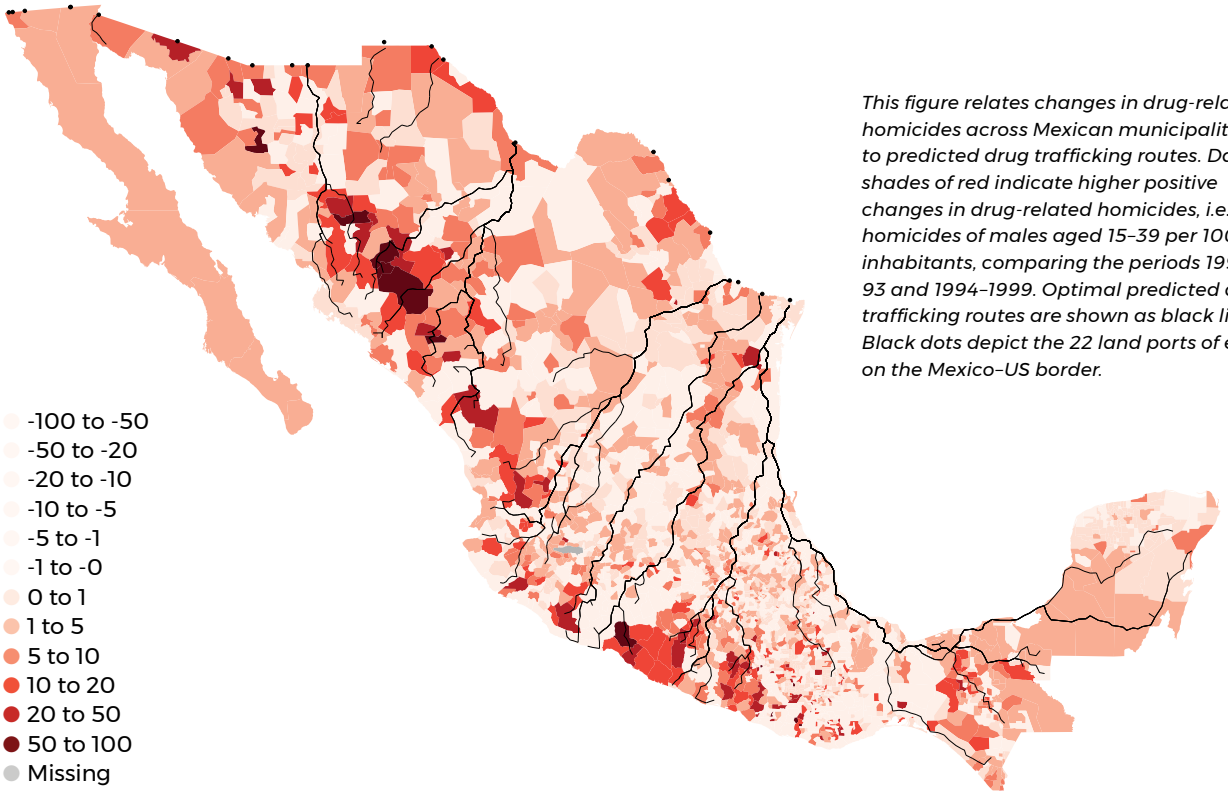
Hidalgo, E. Hornung, E. Selaya, P. (2022). NAFTA and drug-related violence in Mexico. CAGE Working Paper (No. 640).

Figure 1: Predicted drug-trafficking routes



This figure shows the optimal predicted drug-trafficking routes as black lines. Grey lines indicate the full road network in Mexico as of 1993. Red dots depict the 22 land ports of entry on the Mexico–US border. Blue dots depict major known drug-producing and drug-trafficking municipalities.

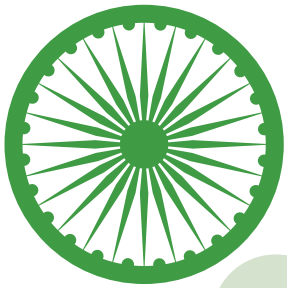
Figure 2: Predicted drug trafficking routes and changes in drug-related homicides



This figure relates changes in drug-related homicides across Mexican municipalities to predicted drug trafficking routes. Darker shades of red indicate higher positive changes in drug-related homicides, i.e., homicides of males aged 15–39 per 100,000 inhabitants, comparing the periods 1990–93 and 1994–1999. Optimal predicted drug-trafficking routes are shown as black lines. Black dots depict the 22 land ports of entry on the Mexico–US border.

Can India achieve low-carbon growth?

By Anant Sudarshan



1.3bn Number of people in India breathing air more polluted than WHO guidelines

97% Percentage of coal in India burnt in Indian factories and power stations

1.5m Projected excess deaths per year in India by 2099 due to climate change

5yrs Reduction of life expectancy in India due to fine particulate pollution

60% Increase of levels of air pollution in India since 1998

"In terms of CO_2 emissions, India is already the world's third largest emitter, and highly vulnerable to the effects of climate change."

Achieving large-scale economic growth against the backdrop of the climate crisis is a huge challenge for India. Emissions trading could be a solution.

No country in history has significantly increased incomes without also consuming more energy. Right now, India uses less than a quarter of the energy of the United Kingdom, on a per capita basis. This will surely rise significantly, and it is hard to believe that it will happen without burning more fossil fuels.

The Indian government's top policy think-tank, the NITI Aayog, has developed a set of energy growth scenarios: Of these, the most aggressive renewable energy scenario forecasts almost a doubling of coal-based energy by 2047.

This is a thorny policy challenge because the environmental costs of this energy undercut its promise of prosperity. These costs include damages from both local air pollution and carbon emissions.

In India, 1.3 billion people now breathe air that is more polluted than World Health Organisation guidelines. Data from the Air Quality Life Index indicates that fine particulate pollution is now reducing life-expectancy by about 5 years on average, far more than malnutrition (1.8 years) or smoking (1.5 years).

In terms of CO_2 emissions, India is already the world's third largest emitter, and highly vulnerable to the effects of climate change. Research suggests that under an RCP 8.5 warming scenario, death rates in India will increase by 0.60 per 1000 in 2099 — roughly 1.5 million excess deaths per year (Carleton et al., 2022). These environmental damages are not decreasing. Levels of air pollution have increased by over 60% since 1998 (AQLI 2022). At current rates of growth, the country is likely to fall short of its own CO_2 emissions targets.

Can India take control of its emissions *and* achieve economic growth?

The role of regulatory innovation

India's environmental record reflects — at least in part — severe weaknesses in the regulatory framework used to manage industrial pollution and fuel choices. Over 97% of coal in the country is burned in factories and power plants. Yet many plants remain out of compliance with pollution standards and direct regulation for CO_2 is practically non-existent. ▶

India needs a solution to effectively control emissions, in a setting where state capacity is limited and reducing the costs of regulation is of the utmost importance. One possibility is the use of market-based instruments, such as cap-and-trade regimes.

Under this system the government sets a limit on the total pollution that a population of regulated plants can emit in a specified period (typically several months or a year). This total is what matters for health or climate benefits. Meanwhile plants can apportion this total amongst themselves by buying and selling permits. This flexibility reduces costs for firms and distinguishes markets from conventional command-and-control mandates that specify hard limits for every plant.

Yet while cap-and-trade markets have been successfully adopted in the United States and the European Union, they are not widely used in developing countries, where less costly regulation may be attractive. My coauthors and I evaluated a new emissions market in India: the first cap-and-trade scheme in India and the first in the world to regulate particulate emissions. This project is also the first time a randomised control trial has been used to measure the impacts of emissions trading.

The Emissions Trading Scheme (ETS) was implemented amongst 342 highly polluting plants in the industrial city of Surat. Half were randomly chosen to be shifted to the new market-based regulation. The other half were regulated as before.

We document three main findings. First, the market worked well: permit trade was active, and plants obtained permits to meet their obligations almost perfectly. This is not a trivial outcome because compliance with traditional regulation is extremely poor in India. Panel A of Figure 1 shows permit trading activity over a one-year period of the market. A meaningful share of the cap is traded every period (spikes in trading activity are on days when auctions were held).

Second, treatment plants (those randomly assigned to the emissions market) reduced particulate matter emissions by about 20%, relative to control plants. Panel B of Figure 1 plots pollution measured by continuous emission monitoring system (CEMS) for plants that were in the market, compared to those that were not. The two lines overlap before the market starts since treatment and control groups were statistically identical by construction. They diverge after the market kicks-off, with treatment plants producing lower pollution.

Third, we find no evidence of increased abatement costs (costs of reducing emissions) for plants in the market, even though pollution was reduced. As a result, the pollution market turns out to be highly cost effective. We estimate that health benefits exceed costs by at least 25 times.

The evidence from this experiment suggests a previously underappreciated benefit of emissions markets in developing country contexts. Textbook economics tells us that market-based regulation may be cheaper. The experience from India suggests another advantage — it may also be more feasible to *implement* markets, especially in settings where state capacity is low and legal enforcement of inflexible mandates is difficult.

Markets and low-carbon growth

Are markets also a pathway to low-carbon growth?

The most concrete example of carbon markets in the developing world comes from China, where a national market is being created from local sector-specific markets. The scale of the China ETS is sweeping — covering over 2000 emitters and 40% of energy related carbon emissions. These markets differ from the EU ETS or indeed our Surat experiment. Instead of setting limits on total emissions, they are designed to reduce emissions intensities — carbon per unit of output — reflecting China's desires to grow its economy as rapidly as possible, while transitioning to a greener trajectory.

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NUMBER OF HIGHLY POLLUTING PLANTS IN THE INDUSTRIAL CITY OF SURAT

The EU and China present two different models, but both are linked by an emphasis on markets as the centrepiece of climate policy. Towards the end of 2022, India passed new legislation enabling the introduction of markets in CO_2. The country is still working on what these might look like but may well come up with a new design of its own.

Overall, the results from the Surat experiment suggest that developing countries can achieve greener growth by changing the incentives that polluters face. When we think about what innovation means in the context of climate policy; new regulation might be just as important as new technology. ◀

About the author

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Figure 1: Permit trading and particulate emissions during the Surat Emissions Trading System trial 2019–21.

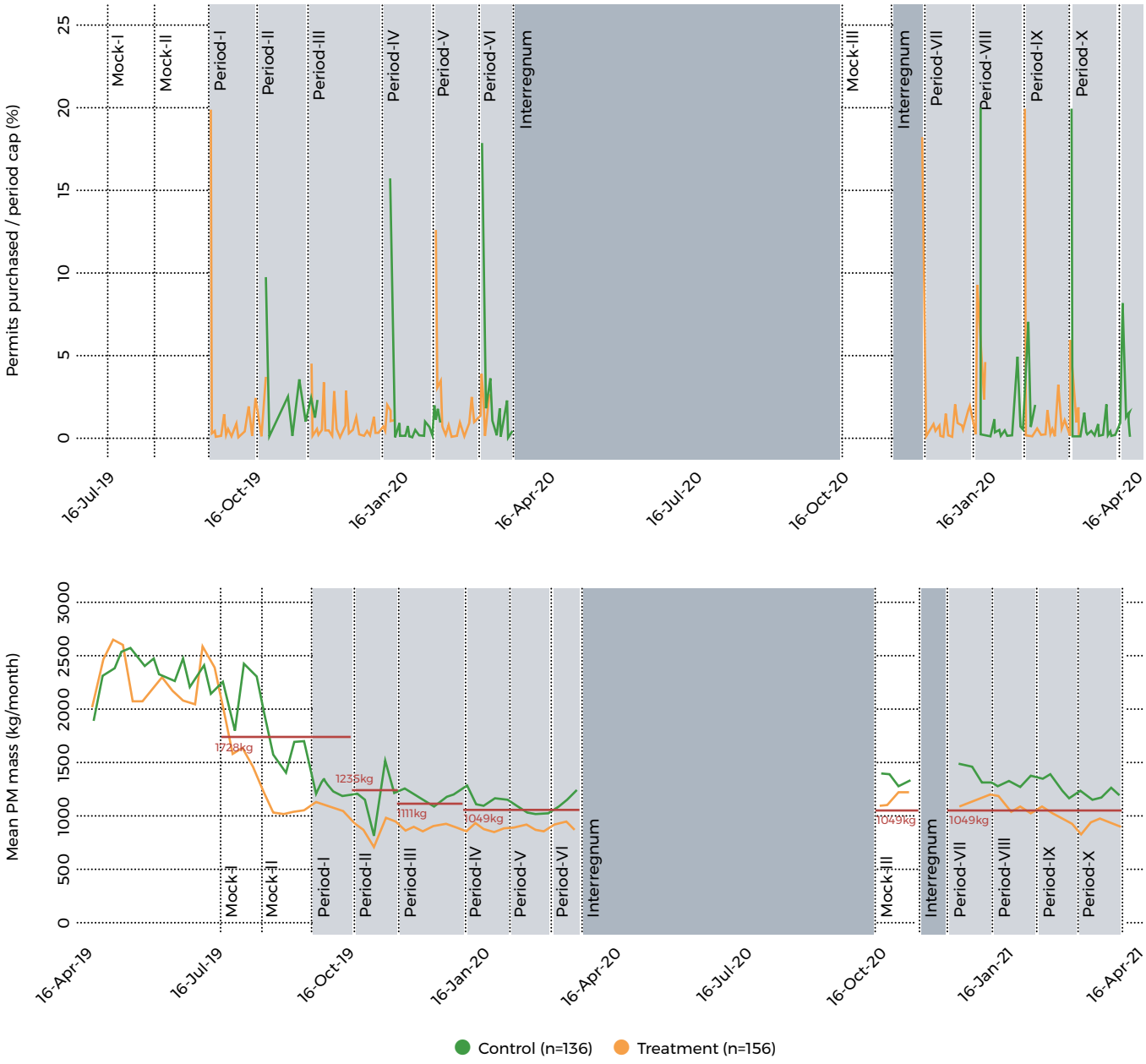
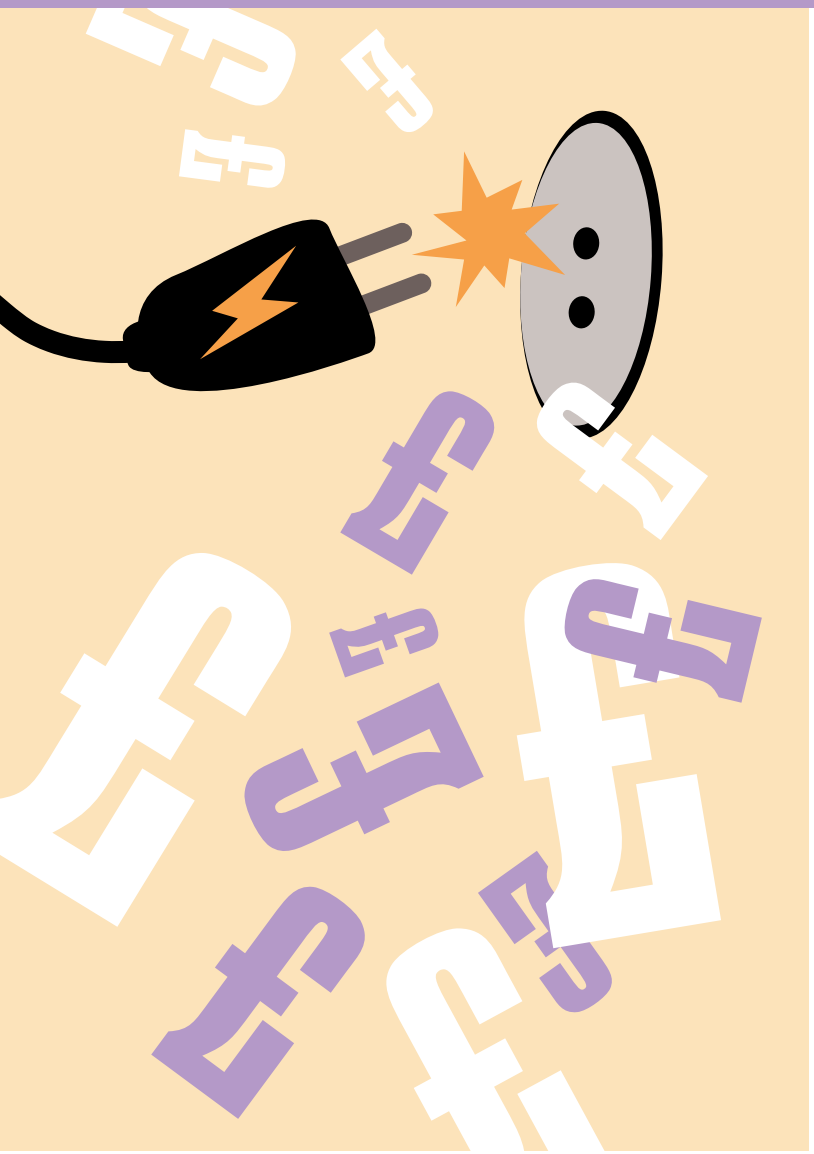


Figure 1: Panel A shows permit trading activity in the Surat ETS over an 18-month period between October 2019 and April 2021. Shaded bands denote compliance periods within the market, which ranged from 4–6 weeks in duration. The orange and green lines show traded quantities as a share of the cap. The market allowed plants to buy and sell permits through weekly auctions and over-the-counter trades. Most transactions occurred on auction days where spikes are visible. Panel B shows the average concentration of suspended particulate matter in plant smokestacks for treatment (orange) and control (green) plants. The two breaks in the time-series correspond to COVID-19 lockdowns when all plants ceased operations.

Parting shot

Generally, businesses are not keen on encouraging customers to cut consumption of their product, governments are not (at least openly) keen on subsidising goods that cause pollution, and no-one is keen on wasting money. Yet all these things have happened in recent years in the energy market.



Of course, these statements must be qualified, but there do seem to have been some dubious decisions made.

To take the first, the government decided some years ago to implement the smart meter programme through suppliers (companies like EDF and E.ON) rather than the transformer and wire owning distributors (like UK Power Networks and Western Power Distribution).

The information from smart meters has two clear purposes: for consumers to observe their consumption and possibly reduce it (potentially contrary to suppliers' sales interests) and for distributors to understand more about the loads in local areas so as to optimise the equipment used to bring electricity to our homes.

In other words, the direct incentives to install smart meters go not to suppliers but to distributors.

It is only recently that suppliers such as Octopus have recognised potential in making offers to consumers that reduce the costs the suppliers pay for electricity, by targeting particular times of day. This has the potential to increase incentives for suppliers to install smart meters, but only for electricity — for gas it is difficult to see where the incentives lie.

> **"... the direct incentives to install smart meters go not to suppliers but to distributors."**

On the second statement, the Government has naturally decided temporarily to subsidise consumers' electricity and gas bills in the light of the large price increases resulting from the conflict between Russia and Ukraine.

But consumers' bills are made up of two elements. One is the unit cost of electricity and gas, the other is the standing charge for taking supply. Both elements have risen over the past year or so. The subsidy has been applied to the unit cost, but not to the standing charge.

This has two negative impacts: It subsidises the cost of consuming fuel (much of which comes from fossil fuel resources) and its impact is regressive, in that it subsidises the rich to a greater extent than the poor, who still need to pay the standing charge even if they consume very little.

In most European countries, large fuel savings have been achieved through coordinated campaigns in a way not seen in Britain. In fairness, it should be noted that the agencies in charge of implementing policies in Britain were given very little notice of Government policy decisions, so were not able to fine-tune the precise responses that a more measured pace would have allowed.

As to our final statement, of course in normal times we had a choice, and an incentive, to shop around amongst suppliers for the best energy deal. But recently, for a variety of reasons, many consumers have been reluctant to do so.

More worryingly, there is evidence that, at least in the early stages of switching, around a quarter of consumers actually switched to a worse deal, whether through miss-selling or because the decision was simply too complex. In other words, they wasted money.

Last year, with the collapse of over 20 supply companies and various Government policy initiatives in place, the chance of saving money shrivelled away anyway. Perhaps default tariffs are here to stay, relieving the harried and confused of one decision too many. ◀

Michael Waterson
Impact Director, CAGE

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CAGE is a research centre based in the Department of Economics at the University of Warwick. We conduct independent policy-driven research informed by history, culture and behaviour. Our aim is to move beyond traditional measures of economic success to consider broader influences on global prosperity: from cultural and behavioural attitudes to voter preferences and political institutions. We analyse historical and contemporary data to draw out lessons for modern policy. CAGE is supported by the Economic and Social Research Council (ESRC).

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