The Political Economy of Automation and Global Production: Evidence from Mexico

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Carles Boix* Valentina González-Rostani† Erica Owen‡

July 18, 2025

Abstract

How does automation in advanced economies affect political and social outcomes in developing countries connected through trade? Extensive research documents technology adoption's effects within post-industrial democracies, yet automation also influences the Global South via global production linkages. Foreign automation represents an economic shock for labor markets exposed through trade and offshoring, reducing labor demand, migration opportunities, and remittance inflows. We theorize these disruptions increase organized crime, as persistent economic hardship restricts employment and migration, incentivizing illicit activities. Additionally, these shocks may boost support for Left populist candidates who advocate pro-worker policies and expanded social protections. Using commuting zone-level data from Mexico, we measure exposure to U.S. automation by combining initial Mexican export-oriented employment distributions with U.S. industry-level robot adoption and import reliance. Highly exposed regions experience reduced migration, increased organized crime (but not property crime), and greater support for Left candidates, highlighting automation's profound political and social implications.

Keywords: automation, offshoring, Global South, emigration, violence.

*Princeton University, cboix@princeton.edu.
†Princeton University, gonzalezrostani@princeton.edu.
‡University of Pittsburgh, ericaowen@pitt.edu.

1 Introduction

The acceleration of automation over recent decades has profoundly affected employment, wages, international production structures, and, consequently, voters' political attitudes and partisan alignments. Extensive economic research shows that adopting new technologies enhances firm competitiveness and labor productivity (e.g., Koch et al., 2021; Bonfiglioli et al., 2024). Yet automation has also reduced labor's share of value-added, leading to unemployment and wage stagnation, particularly among low-skilled workers. It has intensified labor market polarization, shrinking middle-wage employment in developed countries (e.g., Autor et al., 2003; Goos et al., 2009), and accounts for a large share of recent changes in the U.S. wage distribution (Acemoglu and Restrepo, 2022). These economic disruptions have reshaped political preferences and electoral cleavages, increasing political disengagement (Boix, 2019; Gonzalez-Rostani, 2024a), bolstering support for populist and radical-right parties (Owen, 2019; Kurer, 2020; Anelli et al., 2021; Milner, 2021), and fueling demands for redistribution and protection (Busemeyer et al., 2023; Busemeyer and Tober, 2023; Kurer and Häusermann, 2022; Chaudoin and Mangini, 2025; Gonzalez-Rostani, 2024b). However, existing research primarily focuses on advanced economies. How does automation in advanced economies impact developing countries integrated in global production networks?

We know comparatively little about how automation-driven production changes affect the Global South, particularly in terms of their social and political consequences—a gap this study seeks to address. In a globalized economy, technological shifts in one region generate ripple effects elsewhere. Global value chains (GVCs) create complex interdependencies between economies. While emerging markets have long benefited from export opportunities tied to offshoring, recent trends in advanced economies—-particularly the push to "bring back manufacturing"—-pose new challenges for workers in the Global South. Input sourcing from developing countries tripled during the early 2000s, but this expansion has slowed since 2011, likely due to technological advances that erode the comparative advantage of low-wage labor (e.g Faber et al., 2023). Machines increasingly perform the routine tasks once offshored, enabling reshoring in advanced economies and transforming the structure of GVCs (De Backer et al., 2016; Rodrik, 2018; Lund et al., 2019).

Several examples illustrate this shift. Caterpillar reportedly reduced production costs by 90% after reshoring from China and adopting 3D printing in 2012 (Rasmussen, 2016). Similarly, Ford relocated 3,250 jobs from Mexico to Michigan and Ohio in 2016. These shifts highlight how automation, especially in labor-intensive, offshorable segments, can displace developing country workers.

Countries like Mexico, India, Bangladesh, and Vietnam, which specialize in labor-intensive tasks, are especially vulnerable, given their limited capacity to adopt advanced technologies or absorb displaced labor through robust social protections or alternative sectors. Recent empirical work documents how foreign robot adoption in advanced economies is associated with reduced labor demand, wage stagnation, and employment losses in developing countries (e.g., Artuc et al., 2019; Faber, 2020). However, evidence on trade effects remains mixed. Some studies suggest automation reduces demand for manufacturing imports from the Global South (Hidalgo and Micco, 2024), while others highlight increases in demand for primary commodities like minerals and agriculture (Stemmler, 2023). Still others find simultaneous increases in both imports and exports, with offsetting impacts on trade balances (e.g. Artuc et al., 2023).

This paper develops a political economy theory of how automation in the Global North affects societal and political outcomes in the Global South. We argue that these changes reduce labor demand across both developed and developing economies (at least in the short to medium term). This has important implications for migration, which for many Global South countries, plays a critical role in adjusting to local labor shocks. As labor demand contracts in advanced economies, so do opportunities for workers from the Global South to migrate abroad. This amplifies the local impact of economic shocks, particularly in communities closely tied to global production networks. Labor surpluses, in turn, have social and political consequences. Some individuals may turn to informal or illicit activity; others may support candidates who promise stronger redistribution or protection in response to eroding economic opportunity.

Empirically, we examine the effects of foreign robot adoption on migration and violence in Mexico from 1990 up to 2020. We also consider their impact on presidential vote from 2006 to 2024. Using data on robot shipments to Mexico, the United States, and nine European countries—along with labor market information at the commuting zone (CZ) level—we follow the methodologies of Acemoglu and Restrepo (2020) and Faber (2020) to construct measures of local exposure to automation by combining the initial distribution of export-oriented employment across Mexican industries with industry-level trends in U.S. robot adoption and initial U.S. reliance on imports from Mexico. We then estimate the impact of these exposure measures on emigration, organized crime, and presidential election outcomes.

Our results show that regions more exposed to foreign robot adoption experience reduced migration and remittance inflows, increases in narcocrime and homicides, and greater support for populist-left presidential candidates. Notably, these effects are not driven by domestic robot adoption. These findings underscore how foreign technological change transmits across borders and reshapes adjustment channels in developing economies.

We contribute to the literature on the social and political consequences of automation in several way. We offer one of the first systematic analyses of how foreign-driven automation influences migration, violence and political outcomes in the Global South. In doing so, we extend existing work on the labor market effects of foreign automation (Artuc et al., 2019; Kugler et al., 2020a; Faber, 2020), and bridge findings from research on automation in advanced economies (e.g., Kurer, 2020; Gallego and Kurer, 2022) with recent studies of its effects in emerging markets (Giuntella et al., 2024; Hidalgo and Micco, 2024). Our work also has implications for our understanding of the rise of populism and demands for compensatory policies (Stokes, 2025; Baccini et al., 2025; Rettl, 2025). We argue that automation alters the distribution of exit and voice options available to affected populations. As both formal employment and international migration opportunities decline, individuals may shift toward informal or illicit work, while politically mobilized groups increasingly support pro-worker candidates. Overall, our findings highlight how global technological change can deepen instability and restrict mobility in regions already vulnerable to economic volatility.

2 The Political Economy of Foreign Automation Shocks

In this section, we first draw on current economic models to understand how automation in the domestic economy, and particularly abroad, affects employment and wages negatively in the Global South. We then discuss three main social and political consequences of foreign robot adoption. It reduces migration opportunities, exacerbating the negative shock of domestic automation on labor demand and reducing remittances. Citizens may respond to the resulting surplus in the supply of labor by leaving the legal local labor market, leading to a rise in illegal activities and the criminality associated with them. Finally, voters may be more likely to support left-populist candidates who promise pro-redistribution platforms and the redeployment of state-led industrial policies.

2.1 Foreign Automation and Labor Market Disruption

To characterize the economic consequences of automation, we rely on the task model of production processes developed by Acemoglu and Autor (2011) and (Autor, 2013). Generally speaking, this work focuses primarily on the impact of robot adoption on domestic automation and labor markets (Acemoglu and Restrepo, 2020). However, because in emerging markets connected via trade (e.g. exports to the Global North market), Global South workers compete with foreign robots—in offshorable tasks (Faber, 2020), we consider in detail the effects of foreign automation in the discussion that follows.

In the tasks framework, the production of a good or service is broken down into a series of tasks (i.e. discrete units of work). A final good is composed of many intermediate goods and services, and each intermediate output requires that its series of tasks be performed. Firms use a combination of inputs in the production process, including capital (e.g. machines, computers) and labor of varying skills, to perform a particular task. Labor may be domestic or foreign via global production. "Domestic" and "foreign" refer to the worker's location (on- or off-shore) relative to the firm, not nationality. The potential movement of workers across borders shapes the supply of labor in the sending and receiving countries.

In a simple example, firms producing a widget can manufacture the widget hiring domestic workers, employing foreign labor, or using a machine. They will assign tasks to the input with the lowest economic cost, determined by technological capability and opportunity cost. Firms may substitute expensive domestic labor with cheaper foreign labor—or both with capital, as automation expands the set of available production technologies. In equilibrium, inputs specialize in tasks according to their comparative advantage.

Recent technological changes, such as automation, digitalization, and computerization, have expanded the range of labor-saving options available.[1] Growing empirical work on the impact of domestic automation finds that industrial robots, whose impact is the main focus of this paper, are associated with higher productivity, but a lower share of work by unskilled labor (Graetz and Michaels, 2018), reductions in manufacturing employment (Dauth et al., 2021), declines in local employment (Chiacchio et al., 2018), and greater wage disparity between high- and low-skilled workers (Humlum, 2019) in the advanced economies. In recent work focused on emerging markets, Brambilla et al. (2022) examine the impact of domestic robot

[1] Digitalization refers to the adoption of ICT (Kurer and Gallego, 2019); computerization is "job automation by means of computer-controlled equipment" (Frey and Osborne, 2017, 254).

adoption on labor market outcomes in Argentina, Brazil, and Mexico, finding that robot adoption leads to greater unemployment and informality.[2] Similarly, Giuntella et al. (2022) find that domestic robot adoption in China is linked to a substantial decline in labor force participation and wages, especially among low-skilled workers.

Global production enables firms to shift labor-intensive tasks offshore to emerging economies. But the latter are also exposed to foreign automation shocks through "reshoring" and trade linkages—defined here to include the offshore production of intermediate and final goods from the Global North (Feenstra and Hanson, 1999a; De Backer et al., 2016).

Whether trade and labor market outcomes in the Global South are negatively or positively affected by Northern robot adoption depends on the balance of two competing forces: the displacement and productivity effects.

On the one hand, as the cost advantage of Global South labor declines, producing in the Global North becomes more profitable. The adoption of labor-replacing capital in the Global North may reduce the demand for tasks performed by foreign labor and, therefore, for Global South labor in general. Existing research links U.S. robot adoption to job losses and wage reductions, disproportionately affecting women, older workers, and those in small enterprises in emerging markets (Faber, 2020; Kugler et al., 2020b; Artuc et al., 2019). In an analysis of U.S. robot adoption on Mexican labor markets, Artuc et al. (2019) find that each additional robot per thousand US workers results in a 6.7% reduction in the growth rate of Mexican exports per worker (p.16). Faber (2020) documents the negative impacts of robotization in developed countries on exports from developing nations. These findings suggest that as production has been "re-shored" back to the Global North country, there is lower demand for labor in the Global South.

On the other hand, the productivity effect occurs when automation increases the efficiency

[2] The informal sector as a buffer is a distinct characteristic of developing and emerging markets, relative to the advanced economies.

of firms in the Global North, thus increasing their demand for imports of non-automated tasks from the Global South (Artuc et al., 2023; Hidalgo and Micco, 2024). Employment might be preserved or even grow as firms in the Global North expand production and are better able to bear the costs of offshoring. Thus, automation can boost trade by improving productivity, which may lead to an increase in imports from the Global South, despite overall shifts in global production patterns (e.g. Stapleton and Webb, 2020; Artuc et al., 2023).

In the short- to medium-term, we expect that there will be a fall in labor demand with corresponding negative labor market effects, including reduced employment, lower wages, and shifts toward the informal sector. Recall that labor markets in the Global South often operate with some slack or labor surplus, which can limit the ability of low-skilled workers to benefit from globalization (Rudra, 2005). A negative shock means that the adjustment process will be even more difficult in these scenarios. This effect is greater in communities that are more exposed via global production linkages. The impact of automation on labor markets in exposed countries is further compounded by the shift away from manufacturing and toward sectors like mining, reflecting broader shifts in global supply chains (Stemmler, 2023).[3] In a meta-analysis of 24 studies, Pinheiro et al. (2023) find that automation in the Global North facilitates reshoring, suggesting a negative impact on Global South labor markets.

These dynamics underscore the importance of distinguishing between domestic and foreign robot adoption when evaluating labor market outcomes. In this paper, we focus on foreign robot adoption because of our interest in how the distributional effects of technological change spread across borders. Additionally, in the emerging market context, the distributional effects of domestic robot adoption may differ from exposure to foreign robot adoption, because the balance of the labor-replacing and productivity-enhancing effects may differ.

[3] Specifically, Stemmler (2023) shows that while automation reduces the demand for manufactured goods (fewer exports of intermediate inputs), it may simultaneously increase demand for primary goods, such as those from the mining sector.

Indeed, research on robot adoption in emerging markets generally finds a positive effect of domestic robot adoption on labor market outcomes (e.g. Faber, 2020).[4] To address this, we control for exposure to the domestic adoption of robots in our analysis.

2.2 Blocked Exit: How Foreign Automation Constrains Migration

Even when significant push factors exist in developing countries—such as poverty, unemployment, or political instability—the actual volume of emigration depends critically on pull factors in destination labor markets. Migration theory fundamentally holds that individuals will migrate if their expected gains (primarily higher earnings or better employment prospects abroad) surpass the costs associated with moving. If these anticipated benefits decline—due to deteriorating wages or fewer job opportunities in destination economies—fewer individuals will deem migration advantageous. The following section elaborates on how foreign robot adoption can constrain migration outflows, overriding strong economic push factors in sending communities. We expect that the spread of labor-saving technologies in advanced economies can effectively "close the exit door" for potential emigrants. By reducing demand for migrant labor and suppressing expected wages, foreign automation diminishes incentives for workers in the Global South to seek employment abroad, even when conditions at home remain challenging.

In classic models, migration decisions respond to differences in earnings and employment opportunities between origin and destination. Automation in destination countries tends to shrink employment opportunities. For instance, advances in robotics have displaced many manufacturing workers, and had spillover effects on other sectors such as service (Faber et al., 2022), which historically provided employment for immigrants. If a potential migrant anticipates that finding a good job abroad will be difficult due to robots replacing workers,

[4]China is one exception. A possible explanation for this may relate to the fact that China is investing in robots at a much larger scale, which may have a more substantial labor-replacing effect.

the expected benefit of migration falls. High migration costs (financial, social, and legal) further amplify the impact: when destination wages drop or unemployment rises, the fixed costs of migrating become harder to justify.

Empirically, international migration is indeed sensitive to labor market conditions in destination countries. Labor mobility is often seen as a potential adjustment mechanism in the face of negative economic shocks. When local labor demand falls, workers may seek opportunities elsewhere through internal or international migration. The exit of excess workers allows for adjustment in the local labor market (e.g. Autor et al., 2025,?). When a negative shock affects both the sending and receiving locations, as in the case of foreign robot adoption, the migration response may be dampened. Domestic robot adoption in the U.S. has been linked to lower employment and wages in exposed communities (Acemoglu and Restrepo, 2020). This reduces the pull factor of migration: a destination with declining opportunities is less attractive.

A variety of papers demonstrate that migrants are responsive to the decline in opportunities in destination countries. Specifically, Mexican migrants are known to respond to U.S. labor market conditions. For instance, during the Great Recession, worsening U.S. employment prospects led to declines in emigration, increases in return migration, and reduced remittance flows (Caballero et al., 2023; Villarreal, 2014; Jha et al., 2010; Yagan, 2019; Cadena and Kovak, 2016). This was especially true among lower-skilled men (Villarreal, 2014; Cadena and Kovak, 2016). Broader research confirms that economic downturns in destination economies reduce out-migration and strain migrant networks (Becker et al., 2005; Castles and Vezzoli, 2009; Mitchneck and Plane, 1995). These findings underscore how weak demand in destination countries can constrain migration, even when push factors are strong.[5]

There are a number of additional considerations for potential migrants. Migration involves

[5]Additionally, recessions in receiving countries often coincide with heightened anti-immigrant sentiment and restrictive immigration policies, as discussed further in the conclusion.

financial and logistical costs that may be more difficult to overcome during hard economic times. A decline in household resources (due to lower wages or unemployment in the home economy) may limit the ability to pay to migrate, particularly across international borders.

These constraints are more acute for some workers and communities. For displaced manufacturing workers in Mexico, who tend to be lower-skilled but enjoy a modest wage premium in export-oriented jobs compared to low-skill jobs (e.g. Villarreal and Sakamoto, 2011), they are unlikely to transition to similar jobs in the United States.[6] Mexican migrants are often less skilled than native U.S. workers and tend to find employment in lower-paying sectors like construction, agriculture, and services. Notably, the share of Mexican immigrants holding manufacturing jobs in the United States declined even more than the native workers' share between 2000 and 2010 (Arroyo et al., 2022, p. 49).[7] Even if economic opportunities exist in the destination, the cost of changing location and/or industry is high.[8] Migration thus may entail costly occupational and locational transitions that deter mobility (Borusyak et al., 2022).

Additionally, communities with strong historical ties to U.S. regions hit hardest by the Great Recession experienced sharp declines in new emigration and increases in return migration after the shock (Caballero et al., 2023). These dynamics suggest that migration responses are highly uneven, even in the face of shared economic shocks. A key factor reinforcing the "blocked exit" phenomenon is the disruption of migrant networks. Migration is typically self-sustaining: initial migrants reduce the costs for subsequent movers by providing job information, financial assistance, and community support (Munshi, 2003). Yet, if the first wave of migrants never departs due to limited opportunities abroad, these beneficial network effects cannot emerge. Thus, foreign automation—by preventing early migration—prevents

[6]This is a phenomena known as occupational downgrading or skill downgrading.

[7]Meatpacking is somewhat of exception, though this industry is also vulnerable to economic fluctuations and immigration enforcement.

[8]This is consistent with U.S.-based findings that displaced manufacturing workers tend to have lower mobility than non-manufacturing workers. In the context of import competition, Autor et al. (2025) find that such workers often moved into lower-paying service jobs or joblessness within the same region.

the formation or expansion of these networks. The absence or weakening of migrant networks further suppresses future migration flows. Additionally, migrants who manage to secure employment abroad during periods of automation-driven job scarcity will likely face occupational downgrading, accepting positions below their skill level as destination labor markets contract.

While our focus is on international migration, the mechanisms identified in studies of internal migration—declining labor demand, constrained mobility, and poor alternative prospects—apply across borders. In China, for example, robot adoption reduced internal migration inflows among young, low-skilled manufacturing workers (Bian and Zhou, 2024). In the U.S., while both trade and automation reduced manufacturing employment, only robot exposure significantly affected local population dynamics through reduced in-migration (Faber et al., 2022). See also Autor et al. (2025).

Taken together, these findings suggest that migration is not a simple response to negative labor market shocks. Instead, the ability and willingness to migrate are shaped by a combination of factors that push in different directions. We argue that exposure to foreign robot adoption is likely to suppress emigration from the Global South, at least in the short to medium term, because of the dual effect of declining destination opportunities and rising migration barriers. This combination of factors is most likely to appear in communities that are themselves negatively affected by the foreign-robot shock.

Hypothesis 1 (Emigration) *Communities with greater exposure to foreign-robot adoption will experience decreased emigration and reduced remittance flows from the foreign country.*

In sum, the spread of robotics and automation in advanced economies may have unintended consequences for global migration patterns. By dampening the pull factors driving labor mobility, foreign automation risks trapping workers in economies with limited opportunities, creating new challenges for economic development and social stability in the Global

South. Reduced migration and declining remittances hinder economic adjustment in these communities, intensifying local distress. Without emigration as an outlet, sending regions struggle to manage labor surpluses, potentially raising unemployment or underemployment as workers compete for scarce local jobs. Facing these shocks, affected workers may resort to alternative adjustments: economically, by entering informal markets or engaging in illicit and potentially violent activities; politically, by sanctioning incumbents, mobilizing collectively, or supporting parties promising compensation or policies aimed at reversing the negative effects.

2.3 From Labor Market Shock to Criminal Activity

Negative labor shocks have long been associated with increased violence, particularly under conditions of weak institutions and limited state capacity. Prior research has shown that commodity price declines and other income shocks in labor-intensive sectors push individuals toward illicit activities and increase violence (Dube and Vargas, 2013; Dube et al., 2016). Similarly, environmental disruptions, including reduced vegetation or rainfall, have been associated with higher narcocrime rates, especially in vulnerable rural areas (Cavazos Hernandez and Sivakumar, 2022).

This logic extends to labor market shocks driven by global trade and technological change. Dix-Carneiro et al. (2018) find that Brazilian regions more exposed to trade liberalization experienced greater crime rates due to deteriorating labor markets and weakened state service provision.[9] Likewise, Dell et al. (2019) show that Mexican municipalities exposed to U.S.–China import competition suffered job losses and subsequent violence increases.

As a negative economic shock, we expect that foreign robot adoption will lead to more violence in exposed communities. When workers confront diminishing opportunities both

[9] This result holds in the medium term (1991–2000), but not over the full period (1991–2010); see p. 174.

domestically and internationally, their adjustment options shrink. Involvement in illicit activities may become an increasingly necessary alternative, particularly where criminal networks and weak enforcement already exist and social protections are weak. Critically, this mechanism is reinforced by restricted mobility, as discussed in Section 2.2. Constraints on cross-border migration exacerbate the effects of automation-induced shocks, leaving displaced workers trapped in deteriorating local economies. Under these conditions, the opportunity cost of engaging in illicit activities declines, potentially escalating violence and allowing organized criminal groups to deepen their regional influence. We thus hypothesize

Hypothesis 2 (Organized crime) *Communities with greater exposure to foreign-robot adoption will experience increased levels of violence and organized crime.*

As we discuss in more detail in subsection 5.3, the relationship between economic dislocation and violent and organized crime is rooted in a direct economic motivation: engaging in informal and illicit activities. This explanation contrasts with the "deaths of despair" literature, which links automation to rising property crimes through deteriorating mental health outcomes and substance abuse (Liang et al., 2025a).

2.4 Political Backlash: Left Populism

An extensive body of research has linked the rise of wage inequality and rapid skill-biased employment change during the last decades, propelled by digital technologies and robotization, to a process of electoral realignment in the Global North. The lack of response by mainstream parties, and particularly left-wing parties, which traditionally represented low-income voters, to such momentous transformations, provided an electoral opening to a number of populist entrepreneurs at the turn of the century. Growing research has shown that higher exposure to robotization raised support for Trump in 2016 (Frey et al., 2018), driving some voters who supported Democrats in 2012 to switch parties (Gonzalez-Rostani, 2025), and similarly boosted support for radical right parties in Europe (Anelli et al., 2019, 2021; Caselli et al., 2021; Milner, 2021). Likewise, globalization, itself aided by a fall in transportation costs and the information technology revolution, arguably boosted protectionist candidates in both the United States (Margalit, 2011; Jensen et al., 2017; Autor et al., 2020; Che et al., 2022) and Europe (Colantone and Stanig, 2018; Milner, 2021). Riding on the support of anti-globalization and anti-immigration voters, populist parties succeeded in reshaping an electoral map that had been frozen since the Cold War (Boix, 2019).

Low-skilled (as well as semi-skilled) workers in labor-abundant economies (like Mexico), benefiting from the initial process of globalization (Rogowski, 1989), have been found to support free trade in the Global South, at least initially (Rudra et al., 2021). However, foreign robotization likely eroded existing pro-globalization attitudes in Mexican locations impacted by the process of reshoring toward northern economies. That probably entailed a fall in the electoral strength of any parties that had implemented an economic liberalization agenda since the 1980s. As in the North, disaffected voters warmed up to populist-nationalist solutions that rejected the so-called Washington consensus and an international order favoring macroeconomic stability and globalization. Still, whereas northern electorates supported right-wing populist parties, Global South voters mostly leaned toward left-wing populist forces.[10] The Global South shift toward leftist populism, which emphasizes, among other things, beefing up the regulatory state, a more muscular industrial policy around state-owned companies, and higher mandated minimum wages (Edwards, 2019), probably responded to three reasons: the supply of political ideas, the dynamics of migration, and the structure of the welfare state.

First, in the Global North, where mainstream left and right parties agreed on the benefits

[10] Some European voters have also switched to left-wing populist parties. Interestingly, they do in those more "peripheral" regions, that is, those regions that, from an economic point of view, are somewhat closer to middle-income economies: Greece, parts of Spain, and eastern Germany.

of globalization and the market economy, populist candidates often sprouted after grafting themselves to (small) far-right parties. By contrast, Latin American politics had been traditionally organized around an economically liberal (electorally weak) right and a broad, left-leaning populist movement (Dornbusch and Edwards, 1990). The collapse of import-substituting industrialization (ISI) policies and the introduction of structural adjustment programs weakened the latter, temporarily leading an important part of the Latin American Left to embrace the pro-market and moderate pro-redistribution stances of European social democracy (Cleary, 2006; Baker and Greene, 2011; Roberts, 2015). A spike in income inequality, increased unemployment, and the spread of informal jobs resulted in growing voter disillusionment with market reforms driven by the Washington consensus regime (Roberts, 2007; Garay, 2023). Riding on growing popular malaise about "neoliberalism" and globalization, the old Left made a political comeback in several countries (Baker and Greene, 2011; Feierherd et al., 2023; Aksoy et al., 2024), offering what Sebastian Edwards has referred to as a "new populism" program (Edwards, 2019).

Second, as net exporters of labor, the restrictive immigration policies espoused by Global North populists made no sense in Global South countries. Instead, protectionist politics turned around the terms of foreign investment and the potential relocation of multinationals, and, therefore, about the potential need for industrial statism. Populist leaders like Hugo Chávez (Venezuela), Evo Morales (Bolivia), and Andrés Manuel López Obrador (Mexico) explicitly addressed popular discontent by criticizing neoliberalism, privatizations, and foreign influence. In countries most affected by neoliberal reforms, populist candidates, promising redistribution and greater social protection, gained support from voters hurt by market policies and frustrated with right-wing governments (Murillo et al., 2010; Wiesehomeier and Doyle, 2013).

Finally, operating within weak-capacity states, yet concerned about income distribution and poverty alleviation, populist politicians pushed for an expansion of targeted, needs-based programs, legally enforced wage rises, and sector-specific price controls. These policies emerged as traditional labor-based party systems weakened due to declining union membership and widening divisions between formal-sector insiders and precarious informal workers (Garay, 2023).

Overall, our expectation is that a decline in labor market conditions should lead to a leftward shift in citizens' political preferences, as voters increasingly demand pro-worker policies such as social protection, job guarantees, and redistribution.[11] In the particular political context we examine, given the supply of parties, this shift should strengthen left populist candidates. Moreover, it should be more intense in regions with high exposure to foreign automation and therefore more likely to be affected by the closure of foreign-affiliated plants and the decline in remittances. In short:

Hypothesis 3 (Left populism) *Communities with greater exposure to foreign-robot adoption will be more likely to support left-populist political parties.*

3 Background: The Mexican Context

Mexico provides a compelling case for analyzing how automation-driven economic disruptions in advanced economies affect developing countries. Its deep economic integration with the United States, longstanding migration connections, and entrenched organized crime networks uniquely position Mexico to illustrate the broader implications of automation-induced labor market shifts. The economic interdependence is particularly pronounced: in 2024, 83% of Mexico's exports were destined for the U.S. (López and Vázquez, 2025), constituting approximately 15% of total U.S. imports (Mann, 2024). Key sectors such as automotive

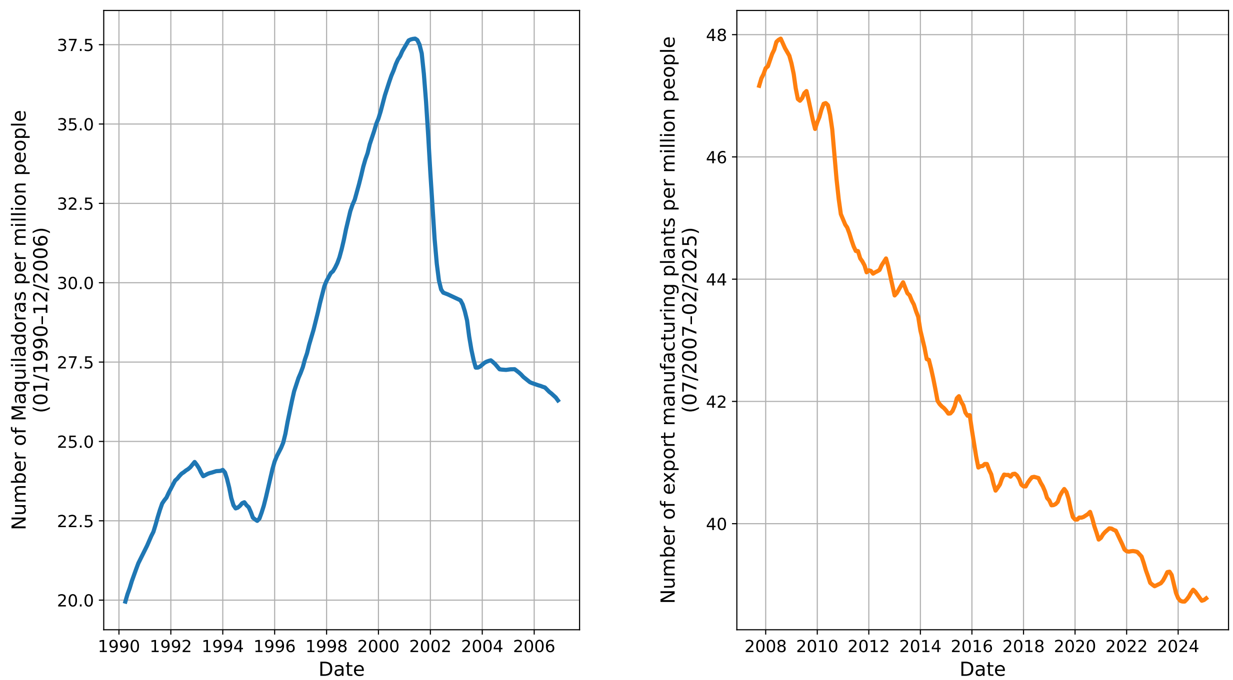
[11] In the Brazilian context, Cavalcante et al. (2023) finds that more exports are associated with support for the right, given less demand for redistribution. At the same time, Rettl (2025) argues that a decline in exports led to a decline in support for PT as citizens shifted their demand for redistribution away from the state and towards evangelical churches.

manufacturing, which have rapidly embraced automation in the U.S., represent significant sources of employment in numerous Mexican regions, rendering them especially susceptible to structural changes abroad.

Historically, migration has profoundly influenced Mexico's social and economic landscapes (González, 2022; García, 2018). Although net migration flows from Mexico to the U.S. have declined (García, 2018), transnational ties remain strong. For example, in 2023, remittances reached \$63.3 billion, equivalent to roughly 4.5% of Mexico's GDP. This amount surpasses earnings from U.S. foreign direct investment, tourism, and manufacturing exports (Berg et al., 2025). Such financial inflows serve as a crucial private safety net, stabilizing household consumption and supporting local public goods (Adida and Girod, 2011; Germano, 2013). Moreover, remittances shape local political behavior by mitigating economic grievances (Germano, 2013) and influencing political mobilization patterns (García, 2018; Ley et al., 2022).

The acceleration of automation in advanced economies has reduced demand for low-skilled labor, curtailed offshoring activities (Artuc et al., 2019; Acemoglu and Restrepo, 2020; Faber, 2020), and thus exposed Mexico—particularly its remittance-dependent communities—to substantial economic vulnerabilities. Crucially, the prevalent influence of criminal organizations within Mexico exacerbates the political and social consequences of economic shocks. Cartels have historically exploited economic downturns and institutional weaknesses, intensifying violence, especially during electoral periods, to assert territorial dominance (Dube et al., 2013; Trejo and Ley, 2021). Thus, Mexico's integration into global trade, its migration networks, and volatile security dynamics offer a particularly insightful context for studying the transnational impacts of technological disruptions.

Figure 1 illustrates the evolving landscape of export-oriented manufacturing plants in Mexico from 1990 to 2025. Following the enactment of NAFTA in 1994, there was a substantial rise in export manufacturing establishments. However, since the mid-2000s, coinciding with



(a) Maquiladoras per million people (Jan 1990–Dec 2006).

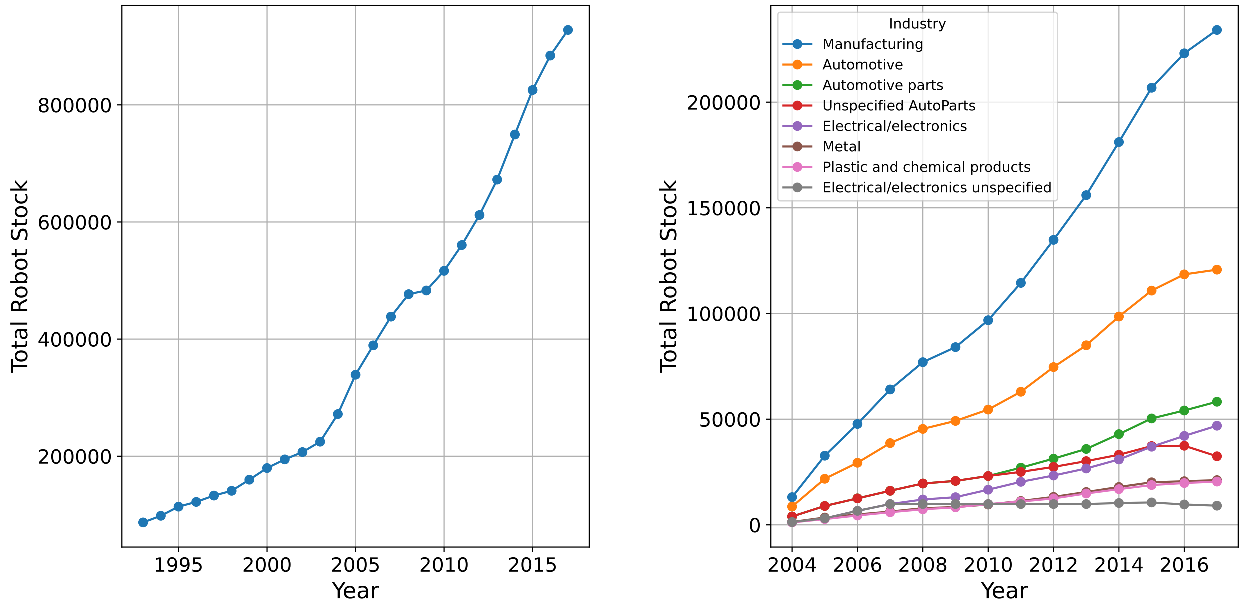
(b) Export manufacturing plants per million people (Jul 2007–Feb 2025).

Figure 1: 4-month moving average number of maquiladoras and number of export manufacturing plants.

Note: This figure plots the 4-month moving averages of maquiladoras (Jan 1990–Dec 2006) and export manufacturing plants (Jul 2007–Feb 2025) per million inhabitants in Mexico. The break around early 2007 arises from a methodological update in INEGI's EMIME and IMMEX series when non-Maquiladora export facilities were first included. Authors' own elaboration based on data from INEGI.

rapid adoption of robotics in the U.S., a marked decline in the number of these plants per capita has occurred, potentially reflecting the displacement of human labor by automation technologies capable of assembling intermediate goods into finished products.

Complementing this, Figure 2a and Figure 2b depict parallel increases in industrial robotics in the United States, particularly within key sectors like automotive, machinery, and electronics, which align closely with Mexico's export profile. The temporal alignment of rising automation and reshoring events is notable: since the mid-2010s, over 200 reshoring incidents have been documented (see Appendix A.1), providing empirical support for automation's influence in reshoring decisions. Drawing on data from the Reshoring Initiative (Reshoring-Initiative, 2025), our exploration highlights automotive production as the most



(a) Industrial Robots (1993–2017).

(b) Industrial Robots by industry (2004–2017).

Figure 2: Stock of Industrial Robots in the United States.

Note: This figure plots robot stock trends by industry in the United States, focusing on the eight industries with the highest total robot stocks from 2004 onwards. Industry-level disaggregated data is available starting from 2004. Authors' own elaboration based on data from the International Federation of Robotics (IFR), 1993–2017.

frequently reshored activity, followed by machinery and electronics—sectors among the most aggressive adopters of automation in the U.S (see Figure A.2). Furthermore, automation emerges as a primary motivation cited by companies for returning production to the U.S. (see Figure A.4). These documented reshoring cases illustrate extreme manifestations; it is likely that subtler adjustments—such as reducing imports of intermediate goods rather than fully relocating production—are even more widespread. Overall, these dynamics underscore Mexico's value as a case study for understanding how global automation trends, within the context of fragmented global production, can generate substantial political and economic consequences for developing countries.

Mexico's Institutional Revolutionary Party (PRI), which had governed uninterruptedly for over seven decades, implemented a package of neoliberal economic reforms in the late twentieth century. Over the subsequent two decades, the center-right National Action Party (PAN), which took over the Mexican government in 2000, and PRI, which regained the Mexican presidency twelve years later, converged around a technocratic, market-oriented consensus. Growing violence and the erosion of the rule of law, caused by the rise of organized crime and its infiltration of electoral and local institutions, compounded by tepid economic growth in real terms and growing concerns over income inequality, triggered significant public disenchantment with both parties (Trejo and Ley, 2021; Gutiérrez-Romero and Iturbe, 2024; Gutiérrez-Romero and UNU-WIDER, 2025). The declining support for the Mexican political establishment then culminated in the decisive 2018 electoral victory of Andrés Manuel López Obrador (AMLO) and his National Regeneration Movement (MORENA), which promised to restore the fast economic growth of the 1960s and 1970s (Castro Cornejo, 2023).

4 Research Design

In this section, we discuss our empirical strategy, measurement, and data sources.

4.1 Empirical Strategy

Our empirical strategy builds upon the methodologies proposed by Acemoglu and Restrepo (2020) and Faber (2020), distinguishing between domestic and foreign exposure to robot adoption. The standard approach to measure exposure to domestic robot adoption, following Acemoglu and Restrepo (2020), is defined as:

$$\text{Exposure to domestic robots}_{c(t_0,t_1)} = \sum_{i \in I} \ell_{ci,1990} \left(\frac{R^{MX}_{i,t_1} - R^{MX}_{i,t_0}}{L_{i,1990}} \right)$$

Here, R^{MX}_{i,t_1} and R^{MX}_{i,t_0} represent the number of robots in industry i in Mexico at times t_1 and t_0, respectively. $\ell_{ci,1990}$ is the share of employment in industry i relative to total employment in region c in 1990, while $L_{i,1990}$ denotes the industry's total employment at that time. Using employment shares from 1990 minimizes endogeneity concerns related to recent economic conditions or policy decisions. Although this domestic robot measure is essential as a control variable, our primary analytical focus is exposure to foreign robot adoption, which is an extension of this approach. Our key measure for foreign robot exposure, following Faber (2020), shifts attention from domestic robot incorporation to automation by trading partners, specifically the U.S. This measure also incorporates offshorability to better reflect external automation shocks:

$$\text{Exposure to foreign robots}_{c(t_0,t_1)} = \sum_{i \in I} \ell^f_{ci,1990} \left(\frac{(R^{US}_{i,t_1} - R^{US}_{i,t_0}) \cdot O_{i,1992}}{L^f_{i,1990}} \right)$$

Here, R^{US}_{i,t_1} and R^{US}_{i,t_0} indicate the estimated number of robots in industry i in the U.S. at times t_1 and t_0, respectively. $\ell^f_{ci,1990}$ represents the share of export-producing employment in industry i relative to total employment in commuting zone c in 1990, and $L^f_{i,1990}$ is total employment in foreign industry i. The offshorability factor $O_{i,1992}$ captures the initial reliance of U.S. industries on Mexican imports as inputs, calculated as:

$O_{i,1992} = \frac{I^{MXUS}_{i,1992}}{Y^{US}_{i,1992}}$

In this formula, $I^{MXUS}_{i,1992}$ is the proportion of U.S. industry i's inputs imported from Mexico, while $Y^{US}_{i,1992}$ is the total output of U.S. industry i. This measure thus quantifies each industry's vulnerability to automation shocks based on its dependence on Mexican-produced inputs.

Finally, we address potential endogeneity arising from the correlation between robot adoption and unobserved factors affecting local labor markets by employing an instrumental variable approach, using the increase in robots in the rest of the world as an instrument for foreign exposure (and we do the same for domestic). Our main independent variable is then:

$$\text{External exposure to foreign robots}_{c(t_0,t_1)} \equiv \sum_{i \in I} \ell^f_{ci,1990} \left(\frac{\left(R^{WLD}_{i,t_1} - R^{WLD}_{i,t_0}\right) \hat{O}_{i,1990}}{L^f_{i,1990}} \right)$$

The superscript WLD denotes the sum over European countries that are also incorporating technology (i.e, excluding the US and Mexico) for which industry-level data are available from 1993 onward.[12] To address potential endogeneity in our initial offshoring to Mexico proxy, we follow Feenstra and Hanson (1999b) and Faber (2020) in defining it as the share of imported intermediate inputs from the same industry over total non-energy intermediates in U.S. industry i in 1990 (across all source countries).

The equation we estimate is as follows:

$$\begin{aligned} y_{POST} = \alpha + \beta^f \text{Exp. to foreign robots}_{c(t_0,t_1)} + \beta^d \text{Exp. to domestic robots}_{c(t_0,t_1)} \\ + \ \mathbf{X}_{c,t_0}\gamma + \delta_t + \varepsilon_{c(t_0,t_1)} \end{aligned}$$

where the dependent variable is one of our three outcomes (emigration, incidence of violent crime, left party vote share) measured in the final period of our sample. The equation controls for the influence of other relevant covariates ($\mathbf{X}_{c,t_0}$), time-period fixed effects (δ_t), and other regional characteristics (e.g., city-specific trends). The unit of analysis is Mexican local labor markets (i.e., commuting zones, CZs). CZs are clusters of municipalities that feature strong commuting ties within, and weak commuting ties across CZs.

In the main text, we present results for the level of the dependent variable post-shock, because of limitations on availability of different outcome variables during the early period. However, in the appendix, as we discuss further below, we present the results for the first differences specifications, where possible, given data constraints.

[12] These countries include Denmark, Finland, France, Germany, Italy, Norway, Spain, Sweden, and the United Kingdom.

4.2 Data

In this section, we describe our main data sources. We note that our independent and control variables are drawn from Faber (2020)'s replication data. We combine his with data on our outcome variables.

Independent Variable: Exposure to Robots The independent variable in our analysis is exposure to foreign robots, which is sourced from Faber (2020). Faber combined Census data, trade data, and robot data from the International Federation of Robotics (IFR). The IFR has collected data on the shipments and operational stocks of industrial robots by country and industry since 1993. These robots are defined as reprogrammable, multipurpose manipulators used in various industrial automation tasks, including manufacturing, agriculture, and utilities (IFR, 2015). In constructing the exposure to robots measures, Faber (2020) used the distribution of employment across industries and CZs, estimating local exposure to robots without relying on actual robot installation data, which is unavailable at the CZ level.

Since most firms produce for both domestic and foreign markets, isolating export-related employment is challenging. However, Maquiladoras are primarily export-oriented; for example, they accounted for nearly half of Mexico's exports in 2005, making them a reliable proxy. Thus, export-producing employment ($\ell^{f}_{ci,1990}$) is measured using Maquiladora employment data from the non-digitized CEPAL (1994) report, processed by Faber (2020).

Exposure to domestic robots is measured using a Bartik-style approach. This method captures variation in exposure driven by the initial conditions of the CZs, including their industrial composition. The formula incorporates the number of robots in each industry and the distribution of employment across CZs, reflecting how industrial concentration influences exposure, rather than relying on direct robot installations within each CZ.

The exposure to foreign robots is calculated based on offshoring. This is done by dividing the value of Mexican imports to the US in each industry (sourced from the UN Comtrade database) by the total output of the corresponding US industry (from the US Bureau of Labor Statistics) in 1992. In this external exposure measure, the offshoring indicator for US industries, $O_{i,1990}$, represents the share of imported intermediate goods in each industry relative to total non-energy intermediates within the US industry in 1990. This measure, inspired by the outsourcing index of Feenstra and Hanson (1999b), typically used for the 4-digit SIC72 classification, is adjusted to the broader IFR industry classification. Faber (2020) mapped each SIC72 industry to an IFR industry and calculated the employment-weighted average for each IFR industry, using employment data from the County Business Patterns (CBP) dataset.

In Figure 3, we show commuting-zone-level exposure to domestic (blue) and foreign (red) robots across Mexico between 2000 and 2015. Exposure to foreign robots, highlighted in red, is largely concentrated in the northern region, reflecting nearshoring dynamics and proximity to U.S. manufacturing centers. Cities with high foreign robot exposure include Ciudad Juárez, Tijuana, Monterrey, and Reynosa. In contrast, exposure to domestic robots, depicted in blue, shows a more balanced distribution across the country, with substantial robotization observed in central areas including Mexico City, Guadalajara, León, and other industrial hubs. This pattern underscores a broader integration of domestic automation compared to the geographically concentrated foreign robot exposure in northern industrial zones.

Dependent Variables For the dependent variables in this analysis—emigration, crime, and vote share—we use data from various sources, which have been merged to create the final dataset for analysis. The data were initially collected at the municipality level and subsequently aggregated at the commuting zones (CZ) level using a crosswalk between mu-

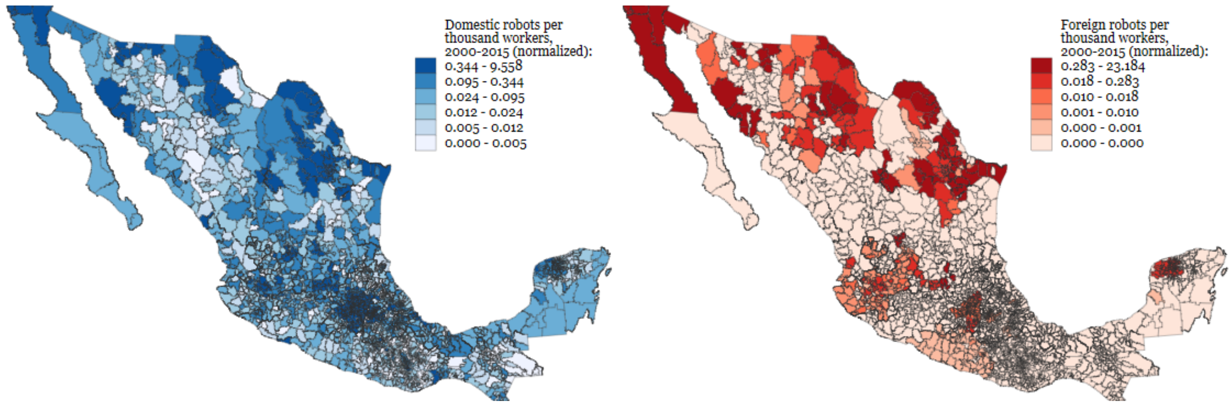


Figure 3: Commuting zone-level variation in exposure to domestic and foreign robots, 2000–2015.

nicipalities and CZs.

We utilize several measures of emigration drawn from data from the National Population Council (CONAPO). We focus on data from 2020.[13] CONAPO offers state- and municipal-level survey data on the number of households receiving remittances in 2020, the number of households with an emigrant in the United States, and the number of households experiencing circular migration. In these economies, remittances are a crucial aspect of the economy, so observing the number of households receiving remittances can serve as another proxy for emigration. Finally, CONAPO provides an emigration intensity index derived from these variables, capturing the general migration trend in each municipality. To construct the final emigration variables, we merge the CONAPO emigration data with the municipality-level data and the crosswalk between municipalities and CZs.

Crime data is also sourced from CONAPO and the Mexican National Institute of Statistics and Geography (INEGI). We obtained the 2018 homicide rate, which represents the number of homicides per 10,000 population by municipality. Additionally, we obtained detailed municipal-level crime data from the Center for Research and National Security (CISEN) for the years 2015-2019, with a focus on 2016. This dataset provides the total number of various types of crime, offering insights into criminal activity at the local level. From this data, we

[13]Note that this data is only available every ten years as part of the census.

extract information on organized crime, specifically narcocrime, and calculate the rate of incidents per 10,000 population in each CZ.

We use general homicide data in Mexico, as official statistics do not consistently track or publish information on drug-related homicides. Given that drug cartels are the primary perpetrators of these killings, previous research frequently relies on overall homicide data as a proxy (BenYishay and Pearlman, 2013; Dell, 2015; Cavazos Hernandez and Sivakumar, 2022).

Our final independent variable relates to electoral outcomes. We are particularly interested in support for left-wing parties, measured as the vote share for Morena. Our analyses focus on the post-shock elections of 2018 and 2024, and we also examine the changes between 2006 and 2024, as well as outcomes for other party families (center, right, and null votes). This data is available from the Base de Datos of the INE (Instituto Nacional Electoral).[14]

Control Variables Several characteristics of the CZ may affect our outcome variables. Drawing on Faber's replication data, we control for several additional factors that may shape our outcomes of interest. The first is the share of workers in occupations usually classified as routine tasks. This measure is derived from occupation-level data and a crosswalk with the US case (Autor, 2013). We control for this in 1990 as a measure of vulnerability to automation prior to the shock.

Two additional variables related to the economic context are also included. First, NAFTA exposure, which captures the effects of the North American Free Trade Agreement, came into effect in 1994 and altered industry-level tariffs for many sectors. The variable measures each CZ's exposure to NAFTA based on its initial employment shares and the tariff changes induced by the agreement. It is proxied as $\sum_{i \in I} \ell_{ci,1990} \Delta\tau_i$, where $\ell_{ci,1990}$ represents the share of employment in industry i out of total CZ employment in 1990, and $\Delta\tau_i$ represents the

[14] https://prep2024.ine.mx/publicacion/nacional/base-datos.

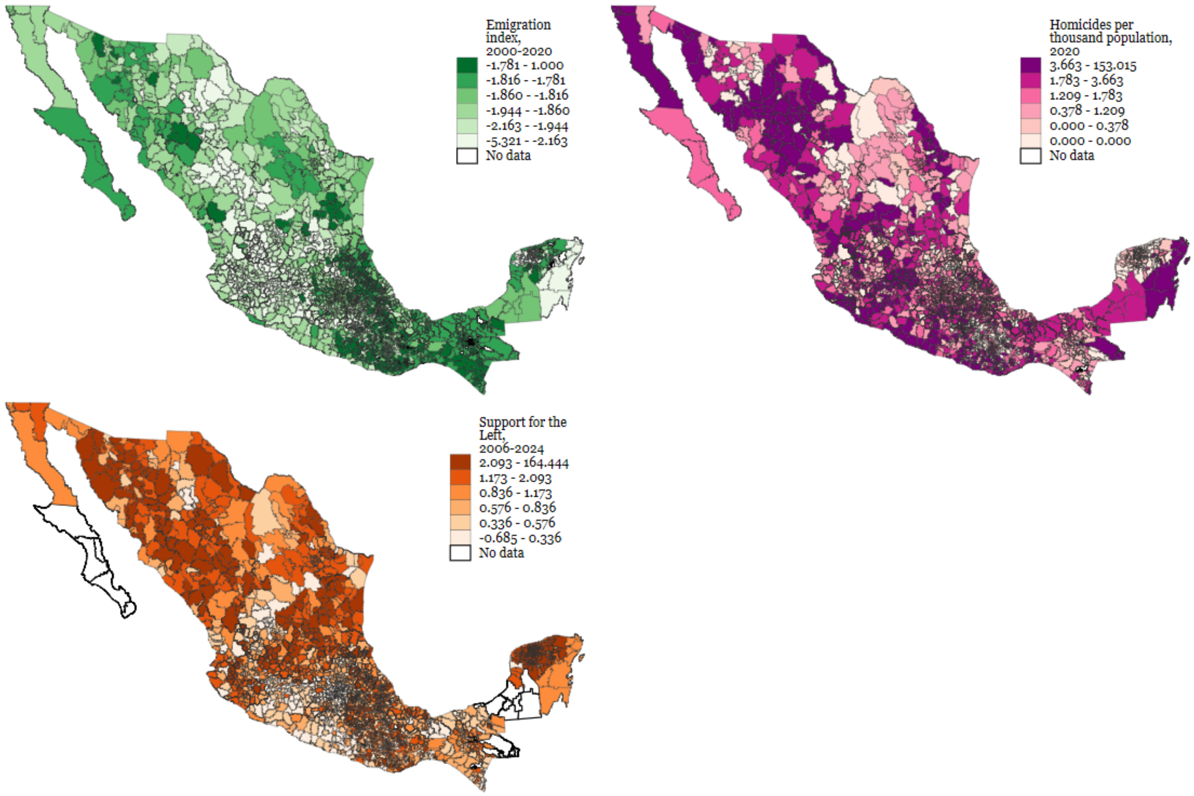


Figure 4: Commuting zone-level variation in the dependent variables.

Notes: The maps represent the variation in the emigration index between 2000 and 2020 (green), homicides per thousand people in 2020, and the variation in support for the Left from 2006 to 2024. Refer to Figure A.7 for a map illustrating the variation in organized crime between 2000 and 2018.

NAFTA-induced tariff change in industry i.

Second, exposure to Chinese import competition is included to account for the impact of increased Chinese imports to both Mexico and the US. This control accounts for changes in Mexican imports from China as well as the indirect competition in foreign markets, using a Bartik-style measure that incorporates industry-specific changes in Chinese imports to both countries. It is defined as:

$$\text{Exp. to Chinese import competition}_{c(t_0,t_1)} = \sum_{i \in I} \ell_{ci,t_0} \left[\frac{I^{CNMX}_{i,t_1} - I^{CNMX}_{i,t_0} + O_{i,t_0}\left(I^{CNUS}_{i,t_1} - I^{CNUS}_{i,t_0}\right)}{L_{i,t_0}} \right]$$

where I^{CNMX}_{i,t_1} and I^{CNMX}_{i,t_0} represent the value of imports from China to Mexico in industry i at times t_1 and t_0, respectively, and I^{CNUS}_{i,t_1} and I^{CNUS}_{i,t_0} represent the same for imports to the US. L_{i,t_0} is the total employment in industry i at time t_0, and O_{i,t_0} is the initial share of imported intermediate goods in US industry i.

In addition to these economic and occupational-level variables, we include demographic characteristics of each CZ. Specifically, we consider pre-shock characteristics such as the share of men and the share of people with primary education as their highest level of education in 1990. For example, a CZ with a high share of people with primary education as the highest educational level may be more likely to experience emigration after the shock. We also include industry employment shares in manufacturing and the share of employment relative to the population in 1990. Moreover, we incorporate dynamic variables, such as the changes in the employment-to-population ratio between 2000 and 2015 (the same period during which robot exposure changed). Finally, we include fixed effects for two time periods and eight broad regions in Mexico.

5 Results

In this section, we present the results of our analyses for emigration, crime, and presidential vote share in turn.

5.1 Evidence of the Mechanism

Before moving to the main results, we present evidence that foreign automation influences local employment outcomes and export performance as outlined in our theory. We estimate a specification parallel to our main specifications of interest using Faber (2020)'s data. Figure 5 presents coefficient estimates illustrating the effects of exposure to domestic and foreign automation on employment across various demographic groups (left panel) and exports across distinct industry sectors (right panel). These results document that exposure to foreign robot adoption is linked to lower employment and a reduction in exports, especially in sectors like electronics, electrical machinery, and automotives. This is important to demonstrate because our theory rests on the assumption that exposure to foreign robots has negative labor market outcomes. We present this here, but also refer interested readers to the extensive analysis in Faber's piece.

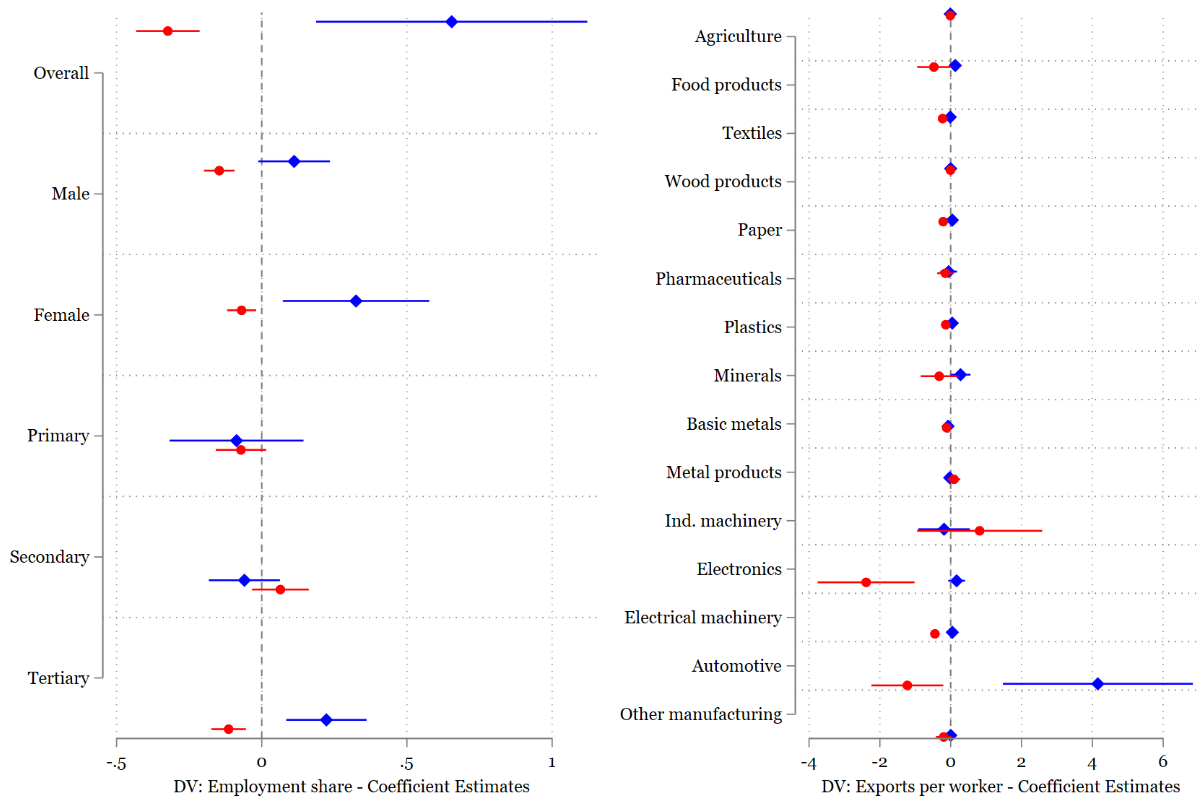


Figure 5: Changes in employment (left panel) and exports (right panel) in relation to exposure to domestic and foreign robots, 2000–2015. Blue coefficients indicate exposure to domestic robots; red coefficients indicate exposure to foreign robots.

Notes: The dependent variables related to employment measure changes in employment levels between 2000 and 2015, either overall, by gender, or by education level. The dependent variable related to exports captures exports per worker by industry between 2004 and 2014. All specifications include the following control variables: (1) Region: fixed effects for eight broad regions in Mexico; (2) Demographics: 1990 commuting zone (CZ) characteristics, including the share of men and the share of individuals whose highest level of education is primary; and (3) Industry: the share of employment in manufacturing in 1990 and the 1990 employment-to-population ratio. All regressions are weighted by each CZ's share of the national working-age population in 1990. Standard errors are robust to heteroskedasticity and clustered at the state level.

In the interest of space, we focus on the effects on overall employment, where exposure to foreign automation is associated with negative employment outcomes, as clearly indicated by the aggregated *Overall* coefficient, whereas domestic automation appears to increase employment. These patterns hold for male and female employment.

An industry-specific examination of exports underscores substantial sectoral variation in susceptibility to foreign automation. The automotive sector notably benefits from enhanced domestic technology integration, demonstrating increased export capacity. In contrast, exposure to foreign robots significantly reduces exports in sectors such as automobiles, food products, and electronics. These outcomes highlight a critical mechanism: increased technological adoption in the US reduces demand for Mexican-produced inputs, adversely impacting export-dependent sectors.

These structural shifts in employment and export patterns provide essential insights into the socio-political dynamics discussed previously. Employment displacement and export decline triggered by foreign automation intensify local economic distress, potentially motivating emigration. However, diminished migration opportunities in the US context constrain this exit strategy, fostering alternative social and political responses such as heightened violence (e.g., increased homicide rates) or growing support for pro-worker political platforms.

5.2 Effects of Foreign Robots on Emigration

Table 1 presents the primary results concerning the impact of foreign robot adoption on emigration. Column 1 indicates that increased exposure to foreign robots significantly reduces the number of households receiving remittances, providing support for our **Hypothesis 1**. Given that remittance inflows could reflect economic conditions in emigrants' host countries, columns 2 to 4 introduce alternative proxies for emigration to strengthen the analysis. Columns 2 and 3, which examine the number of emigrants and circular migration, respectively, reveal consistent negative effects. Column 4 reinforces these findings by employing an emigration index as an additional measure. To address potential endogeneity concerns, we implement an instrumental variable strategy, instrumenting foreign robot exposure with robot adoption in countries excluding the United States. The results from this approach confirm and indeed strengthen our earlier findings, with even greater statistical significance.

While the aforementioned results focus on the post-shock levels of emigration-related outcomes, we further analyze changes in the emigration index over the period from 2000 to 2020. These results, presented in Table A.4, reaffirm that higher exposure to foreign robots is negatively correlated with emigration trends.

Table 1: Impact of exposure to robots on emigration.

OLS	(1) Remittance	(2) Emigrants	(3) Circulate	(4) Emigration
External exposure to domestic robots	7.963	1.611	0.403	0.0594
	(8.812)	(1.629)	(0.382)	(0.0895)
External exposure to foreign robots	-2.420**	-0.508**	-0.202***	-0.0611**
	(0.904)	(0.203)	(0.0641)	(0.0230)
Demographics	✓	✓	✓	✓
Industry	✓	✓	✓	✓
Region	✓	✓	✓	✓
Observations	1805	1805	1805	1796
R^2	0.720	0.702	0.802	0.520
IV	(1) Remittance	(2) Emigrants	(3) Circulate	(4) Emigration
Exposure to domestic robots	7.482	1.514	0.376	0.0544
	(8.152)	(1.505)	(0.353)	(0.0819)
Exposure to foreign robots	-2.678***	-0.562***	-0.223***	-0.0674***
	(0.913)	(0.203)	(0.0611)	(0.0234)
Demographics	✓	✓	✓	✓
Industry	✓	✓	✓	✓
Region	✓	✓	✓	✓
Observations	1805	1805	1805	1796
R^2	0.721	0.705	0.806	0.522
F	287.6	138.7	137.1	119.6
Kleibergen-Paap Wald F-stat	172.7	172.7	172.7	172.7

Notes: The dependent variable in columns 1 to 3 refers to the number of households either receiving remittances, having emigrants in the family, or experiencing circular migration. In column 4, the dependent variable refers to the intensity of the emigration index. All specifications include the following control variables: 1) Region: fixed effects for eight broad regions in Mexico; 2) Demographics: 1990 CZ demographics, including the share of men and the share of people with primary education as their highest level; 3) Industry: shares of employment in manufacturing in 1990 and the 1990 level of employment-to-population ratio. All regressions are weighted by a CZ's share of the national working-age population in 1990. Standard errors are robust to heteroskedasticity and clustered by state. The coefficients marked with $***$, $**$, and $*$ are significant at the 1%, 5%, and 10% confidence levels, respectively. Refer to the full Tables in Appendix A.2-A.3. Refer to Table A.4 for results examining changes in emigration between 2000 and 2020.

Regarding the magnitude of these effects, focusing on column 1 of Table 1, a one standard deviation increase in exposure to foreign robots (1.18) results in an approximately three (2.839) percentage point (pp) decrease in the number of households receiving remittances, which is approximately a 21% decrease relative to the overall variation in remittances. Table 1 also reports the results for domestic robots, one of our main control variables. In contrast to foreign robots, domestic robots exhibit no significant effect on emigration outcomes. This is consistent with

Thus, exposure to foreign robots appears to reduce migration incentives. Increased automation in the U.S. likely signals fewer employment opportunities for migrants, particularly in manufacturing sectors closely integrated with Mexican industry. However, these impacts also spill over into service sectors (Faber et al., 2022), further shrinking potential migrant opportunities. This aligns with prior studies indicating migrants' responsiveness to negative economic shocks abroad (Yagan, 2019; Cadena and Kovak, 2016) and underscores the role of migration-facilitating social networks between Mexico and the U.S. (Munshi, 2003). As U.S.-Mexican firms face reduced export demand, potential migrants perceive diminished labor prospects, thereby deterring emigration.

In summary, technological adoption in Mexico's trading partners, notably the U.S., initially triggers labor displacement, affecting migration patterns through the interplay of push factors (local economic hardship) and pull factors (foreign technological changes). These findings emphasize the need to consider both domestic and international technological developments when analyzing migration dynamics.

5.3 Effect of Foreign Robots on Organized Crime

Shifting our focus to an alternative exit option, particularly relevant in the Global South, we consider involvement in organized crime. Table 2 reports the results consistent with our **Hypothesis 2**. Column 2, for example, shows that exposure to foreign robots is positively correlated with the number of homicides. We observe similar effects for other crime categories, such as narcocrime and human trafficking (columns 4 and 5).

A one standard deviation increase in foreign robot exposure results in an increase of 0.25 homicides per 10,000 population, equating to a 4.33 pp increase relative to the standard deviation of the homicide rate. For narcocrime, a one standard deviation increase in foreign robots corresponds to a 28% increase in the rate of narcocrimes per 10,000 population, relative to the SD of narcocrime rates. We also find consistent evidence when examining changes in organized crime from 2000 to 2018 using the measure developed by Osorio and Beltran (2020), which employs NLP techniques to detect news reports about organized crime. This measure similarly reveals a pattern of increased organized crime linked to greater foreign robot exposure. See Table A.8.

Substantively, the positive relationship between foreign robot exposure and both homicides and narcocrime suggests a scenario where technological advancements abroad, particularly in countries like the US, may exacerbate inequalities and drive crime in developing countries, for instance, by the decline of offshoring from the North. Relating this to our results on emigration, one possible explanation is that as robots and automation are increasingly adopted in high-income countries, they may reduce the demand for labor in traditional industries that have historically served as migration routes for lower-skilled workers from the Global South (e.g, services). This reduction in job opportunities abroad may increase the frustration and economic vulnerability of potential migrants, pushing some individuals to engage in illegal activities or organized crime as an alternative means of income.

Furthermore, foreign robots could lead to a shift in global supply chains, affecting the economic viability of industries in developing countries. As foreign firms increasingly adopt automation, they may reduce the demand for intermediate goods from the Global South, causing disruptions in local economies. This economic disruption may increase poverty and social instability, which can be linked to higher levels of crime.

Table 2: Impact of exposure to robots on violence.

OLS	(1) Crimes	(2) Homicides	(3) Kidnapping	(4) Narco	(5) Human Traffic
External exposure to domestic robots	-7.017**	-0.781**	-0.0107	-0.792	0.00185
	(3.353)	(0.322)	(0.0189)	(0.559)	(0.00616)
External exposure to foreign robots	0.747	0.211**	0.0100**	0.592**	0.00336**
	(0.718)	(0.100)	(0.00388)	(0.285)	(0.00155)
Demographics	✓	✓	✓	✓	✓
Industry	✓	✓	✓	✓	✓
Region	✓	✓	✓	✓	✓
Observations	1802	1802	1802	1802	1802
R^2	0.166	0.197	0.130	0.455	0.127
IV	(1) Crimes	(2) Homicides	(3) Kidnapping	(4) Narco	(5) Human Traffic
Exposure to domestic robots	-6.638**	-0.734**	-0.00981	-0.733	0.00187
	(3.103)	(0.297)	(0.0175)	(0.543)	(0.00580)
Exposure to foreign robots	0.833	0.234**	0.0111***	0.654*	0.00369**
	(0.769)	(0.114)	(0.00397)	(0.336)	(0.00184)
Demographics	✓	✓	✓	✓	✓
Industry	✓	✓	✓	✓	✓
Region	✓	✓	✓	✓	✓
Observations	1802	1802	1802	1802	1802
R^2	0.170	0.203	0.132	0.409	0.122
F	12.09	9.267	21.68	6.305	15.00
Kleibergen-Paap Wald F-stat	172.7	172.7	172.7	172.7	172.7

Notes: The dependent variable in column 1 refers to the homicide rate, while column 2 refers to the number of homicides per 10,000 population, both sourced from CONAPO. Column 3 refers to the number of narcocrimes per 10,000 population, sourced from CISEN. All specifications include the following control variables: 1) Region: fixed effects for eight broad regions in Mexico; 2) Demographics: 1990 CZ demographics, including the share of men and the share of people with primary education as their highest level; 3) Industry: shares of employment in manufacturing in 1990 and the 1990 level of employment-to-population ratio. All regressions are weighted by a CZ's share of the national working-age population in 1990. Standard errors are robust to heteroskedasticity and clustered by state. The coefficients marked with $***$, $**$, and $*$ are significant at the 1%, 5%, and 10% confidence levels, respectively. Refer to the full Tables in Appendix A.6-A.7. Refer to Table A.8 for results examining changes in organized crime between 2000 and 2018.

The increase in narcocrime may reflect the tendency of criminal organizations to expand as legitimate economic opportunities diminish. In settings such as Mexico—where organized criminal groups maintain a sustained presence and operate within weak or contested state institutions—economic shocks do more than generate incidental violence; they provide strategic openings for criminal groups to enhance their influence. This aligns with prior research emphasizing that criminal organizations frequently serve as alternative sources of employment during economic downturns (Dube and Vargas, 2013; Dube et al., 2016). Such dynamics have significant political implications, as economically driven expansions of organized crime enable groups to leverage violence, influence electoral outcomes, capture local governments, and renegotiate territorial control (Dube et al., 2013; Trejo and Ley, 2018, 2021). Moreover, strengthened criminal organizations become more capable of forging agreements with politicians or targeting opposition candidates to secure favorable governance arrangements (Hernández Huerta, 2020).

Our argument emphasizes a structural, economically rational explanation for the relationship between automation and crime. In contexts characterized by job displacement and constrained labor mobility, individuals experience a reduction in the opportunity cost of engaging in illicit activities. This economic mechanism contrasts with Liang et al.'s 2025b findings for the U.S., which link automation-driven increases in crime primarily to psychological factors—specifically mental health deterioration and "deaths of despair"—rather than to direct economic incentives. Supporting our economic rationale, Tables A.10 and A.11 show no significant relationship between exposure to foreign robots and crimes typically associated with despair-driven motivations, such as property crimes or sexual offenses.[15]

5.4 The Effect of Foreign Robots on Populist Backlash

We now examine whether exposure to foreign automation translates into measurable political shifts. Table 3 presents OLS and IV estimates of the impact of foreign robot exposure on voting shares for the left-populist coalition—Morena and its 2024 presidential candidate, Claudia Sheinbaum—across commuting zones. Column 1 demonstrates a positive and statistically significant relationship between foreign robot exposure and support for left-wing populism, indicating that regions more exposed to automation abroad systematically exhibited greater backing for Morena in 2024. Our preferred IV model, which addresses potential endogeneity by treating foreign automation as an exogenous shock, similarly shows a significant increase in Morena's vote share. Conversely, columns 2 and 3 illustrate a decline in

[15]Notably, while automation in advanced economies has generally been associated with increased crime rates, we observe the opposite for domestic robot adoption in our analysis. Specifically, the coefficient for domestic robot adoption is either negative and statistically significant or indistinguishable from zero.

support for right and center parties, traditionally associated with the political establishment (Castro Cornejo, 2023). Additionally, re-estimating the model to assess changes in populist support yields consistent findings (refer to Table A.17).

Table 3: Effect of Robot Exposure on Electoral Outcomes in 2024 elections

OLS	(1) Sheinbaum (Left)	(2) Galvez (Right)	(3) Alvarez (Center)	(4) Null
External exposure to domestic robots	0.0194	-0.0166	-0.00280	0.000837
	(0.0119)	(0.0131)	(0.00443)	(0.000602)
External exposure to foreign robots	0.00721**	-0.00452	-0.00267*	0.000172
	(0.00274)	(0.00283)	(0.00151)	(0.000191)
Demographics	✓	✓	✓	✓
Industry	✓	✓	✓	✓
Region	✓	✓	✓	✓
Observations	1800	1800	1800	1800
R^2	0.537	0.422	0.292	0.328
IV	(1) Sheinbaum (Left)	(2) Galvez (Right)	(3) Alvarez (Center)	(4) Null
Exposure to domestic robots	0.0186*	-0.0159	-0.00274	0.000801
	(0.0106)	(0.0120)	(0.00414)	(0.000559)
Exposure to foreign robots	0.00792***	-0.00495*	-0.00294*	0.000189
	(0.00277)	(0.00297)	(0.00160)	(0.000202)
Demographics	✓	✓	✓	✓
Industry	✓	✓	✓	✓
Region	✓	✓	✓	✓
Observations	1800	1800	1800	1800
R^2	0.546	0.429	0.293	0.328
F	45.39	49.80	16.95	17.32
Kleibergen-Paap Wald F-stat	172.7	172.7	172.7	172.7

Notes: The dependent variables in columns 1–3 represent each candidate's share of valid votes. Column 4 reports the share of null votes relative to the total number of votes cast. All specifications include the following control variables: 1) Region: fixed effects for eight broad regions in Mexico; 2) Demographics: 1990 CZ demographics, including the share of men and the share of people with primary education as their highest level; 3) Industry: shares of employment in manufacturing in 1990 and the 1990 level of employment-to-population ratio. All regressions are weighted by a CZ's share of the national working-age population in 1990. Standard errors are robust to heteroskedasticity and clustered by state. The coefficients marked with $***$, $**$, and $*$ are significant at the 1%, 5%, and 10% confidence levels, respectively. Refer to the full Tables in Appendix A.13-A.14. Refer to Table A.17 and Table A.18 for results examining changes between the 2006 and 2024 elections.

Substantively, these results indicate greater support for the left-wing populist (anti-establishment) candidate in communities highly exposed to foreign automation compared to otherwise similar but less affected communities. This provides evidence supporting our **Hypothesis 3**, which argues that economic disruptions from foreign automation heighten the demand for redistributionist and economically nationalist policies in affected regions.

These findings carry important political implications, demonstrating that foreign automation operates as an external economic shock capable of triggering populist backlash. In Mexico's context, this backlash notably manifested as left-wing populism. Regions heavily impacted by robot-driven job losses rallied behind Morena, a party advocating substantial redistribution and stronger governmental economic intervention. This aligns with historical patterns in Latin America, where left-wing populist movements have successfully challenged globalization and expanded the state's economic role (Edwards, 2010). Morena effectively capitalized on these sentiments, emphasizing neoliberal failures, promoting economic sovereignty, and pledging enhanced social safety nets and support for domestic industries.

While automation-induced disruptions often fuel right-wing populism and nationalist sentiment in Western Europe and the United States (Anelli et al., 2021; Frey et al., 2017; Gonzalez-Rostani, 2025), the presence of a credible left-populist alternative in Mexico channeled workers' grievances toward the political left. Our findings demonstrate that the ideological direction of populist responses to economic shocks varies contextually, particularly leaning leftward in middle-income democracies with viable left-populist movements. Regardless of ideological orientation, distributive politics remain central in addressing the demands of economically vulnerable groups as evidenced by previous work on the US (Gonzalez-Rostani, 2025). Morena directly appealed to these voters through commitments to cash transfers, expanded social programs, increased minimum wages, improved pensions, and investments in domestic infrastructure. Additionally, economic nationalism featured prominently, as Morena blamed previous administrations and international economic pressures for local hardships. Claudia Sheinbaum, aligned with President López Obrador, emphasized nationalist policies, advocating Mexico's energy sovereignty, criticizing unfavorable trade agreements, and aiming to reclaim strategic sectors—positions that resonated deeply with voters adversely affected by international competition.

6 Conclusions

Our findings demonstrate that technological change and its impacts on society are not confined by borders. To understand political and economic pressures today, we must account for both direct (i.e. domestic) and indirect (i.e. foreign) robot exposure. Our findings reveal that foreign robots—-those adopted in the Global North-—exert profound effects on social and political outcomes in countries like Mexico. Based on Faber's estimations, between 1993 and 2015, 234,000 robots were installed in the US, and each robot installed in the US corresponds to a loss of slightly more than one job in Mexico. This indicates that the technological changes in the North not only directly impact employment in their own countries but also create significant indirect effects on labor markets in the South. These foreign automation shocks, transmitted through global production networks and offshoring channels, disrupt labor demand in ways that impact migration, violence, and political behavior. Notably, the effects of domestic robots often differ in terms of the magnitude and sign of the effect.

First, we show that exposure to foreign robots reduces emigration from Mexico. Drawing on Faber, who estimates that each U.S. robot displaces more than one Mexican job, we argue that foreign robot adoption suppresses key push and pull factors in migration. With fewer opportunities in offshoring sectors like manufacturing and diminishing demand in destination countries like the US, emigration becomes less viable, even as local conditions worsen.

This challenges conventional models that treat migration as a pressure-release valve. Instead, our findings demonstrate that reshoring and foreign automation can effectively "close the exit," intensifying the burdens on local labor markets and communities in the Global South.

The decline in emigration has far-reaching political implications, particularly where migration and remittances function as informal welfare systems. Previous research shows that remittance-receiving households are less likely to express discontent, demand redistribution, or support opposition parties (Germano, 2013; Adida and Girod, 2011).

As economic opportunities dry up and migration pathways close, organized criminal groups become an alternative source of income and authority. Our results are consistent with prior findings that cartels exploit both institutional weakness and economic precarity to expand their influence, particularly during electoral transitions (Trejo and Ley, 2021; Dube et al., 2013).

In this context, foreign automation does not merely displace labor—it reshapes governance structures and fuels instability. By linking economic dislocation to the expansion of criminal power and the erosion of democratic accountability, our study reveals how global technological change acts as a catalyst for violence and institutional decay in affected regions.

Moreover, the economic impacts of foreign robot adoption change citizens' relationship with the state: demands for redistribution grow, political discontent rises, and support shifts toward left presidential candidates. Thus, our findings suggest that foreign automation indirectly alters electoral preferences, as communities facing reduced migration opportunities and declining remittances become more likely to support redistributive and opposition platforms. This link between automation abroad and political realignment at home underscores how global production shocks shape domestic political economies in underexplored ways.

Our study pushes scholars to look beyond domestic automation when assessing the consequences of technological change. Automation in the North generates economic and political aftershocks in the South, with significant implications for migration, violence, and democratic governance. These findings suggest that any full account of technology's consequences must consider not just where robots are installed, but whose jobs—-and whose futures—-are displaced.

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A Online Appendix

Contents

A.1 Reshoring from Mexico 1

A.1.1 Reshoring Examples 2

A.2 Descriptive: Robots 6

A.3 Descriptive: Violence 6

A.4 Results: Emigration 9

A.5 Results: Violence 13

A.5.1 Results: Death of Despair? 17

A.6 Results: Blocked Exit Options 19

A.7 Results: Politics 20

A.1 Reshoring from Mexico

This section examines cases of reshoring from Mexico to the United States since the mid-2000s, with a particular focus on automation-driven relocations.

The dataset was manually compiled from the *Reshore Now* library.[16] All cases available with associated news articles and basic project descriptions were included (a total of 184 cases of restoring from Mexico to the US). For each reshoring event, we collected information on the company involved, the year of reshoring announcement, the industry sector affected, the stated motivations for reshoring, and additional project details when available. Importantly, we focused exclusively on cases where production was previously located in Mexico and subsequently relocated to the United States.

Figure A.1 presents the number of reshoring cases by year. The data show a notable concentration of reshoring announcements between 2012 and 2014. Figure A.2 depicts the distribution of reshoring cases across industries, with automotive and transportation sectors accounting for the largest share, followed by miscellaneous manufacturing and machinery industries.

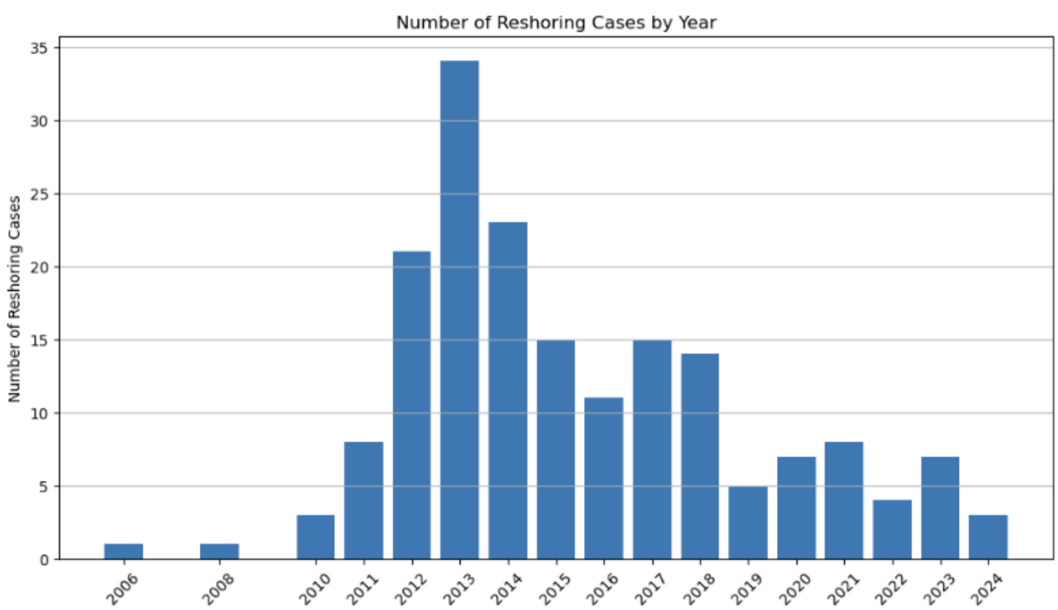

Figure A.1: Number of Reshoring Cases by Year

To better understand the motivations behind reshoring, we conducted a textual analysis of project descriptions. Figure A.3 shows a word cloud summarizing the most frequently cited terms, highlighting incentives, proximity to customers, supply chain improvements, and automation as prominent themes.

Building on this, we employed an unsupervised topic modeling approach (Latent Dirichlet

[16] https://www.reshorenow.org/main-reshoring-library/

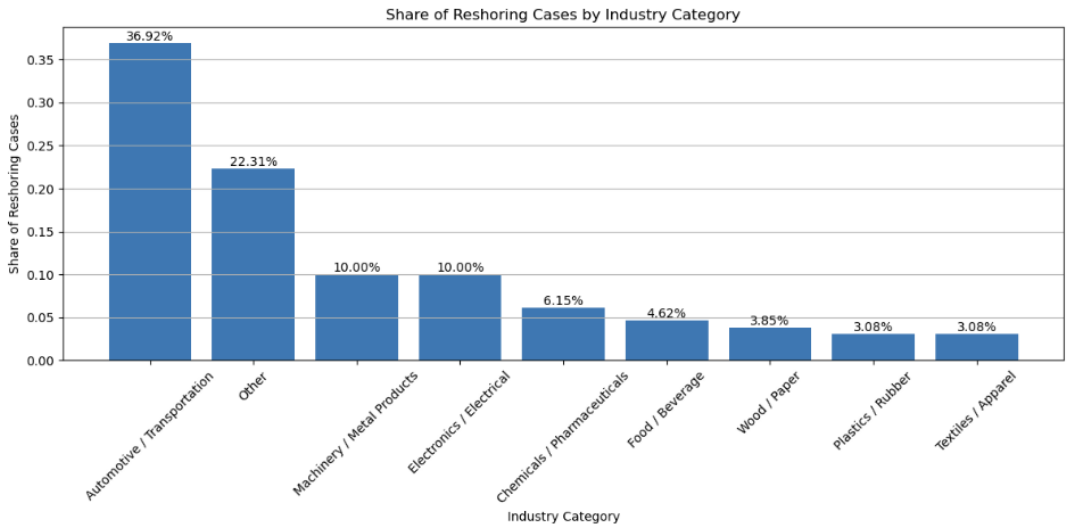

Figure A.2: Share of Reshoring Cases by Industry Category

Allocation, LDA) to classify the main reasons for reshoring. Figure A.4 displays the share of each topic identified through this analysis. The LDA model identified four dominant reshoring rationales, with one of the topics being automation:

- **Brand Image and Wages:** Several companies emphasized concerns related to brand reputation, customer responsiveness, and the control of labor costs. Commonly cited terms include *image*, *brand*, *wages*, and *responsiveness*.
- **Supply Chain and Quality:** Many cases referenced efforts to strengthen logistics, reduce lead times, improve product quality, and enhance supply chain resilience. Keywords associated with this topic include *cost*, *lead*, *market*, *quality*, and *supply chain*.
- **Proximity and Incentives:** Proximity to the U.S. customer base and access to government incentives emerged as crucial drivers in a significant number of cases. Terms such as *proximity*, *incentives*, *government*, and *tax* are central to this topic.
- **Technology and Automation:** A growing share of reshoring is associated with investments in technological capabilities, automation, and manufacturing process innovations. Relevant terms include *technology*, *automation*, *workforce*, and *innovation*.

A.1.1 Reshoring Examples

Figure A.3: Word Cloud of Main Reshoring Reasons

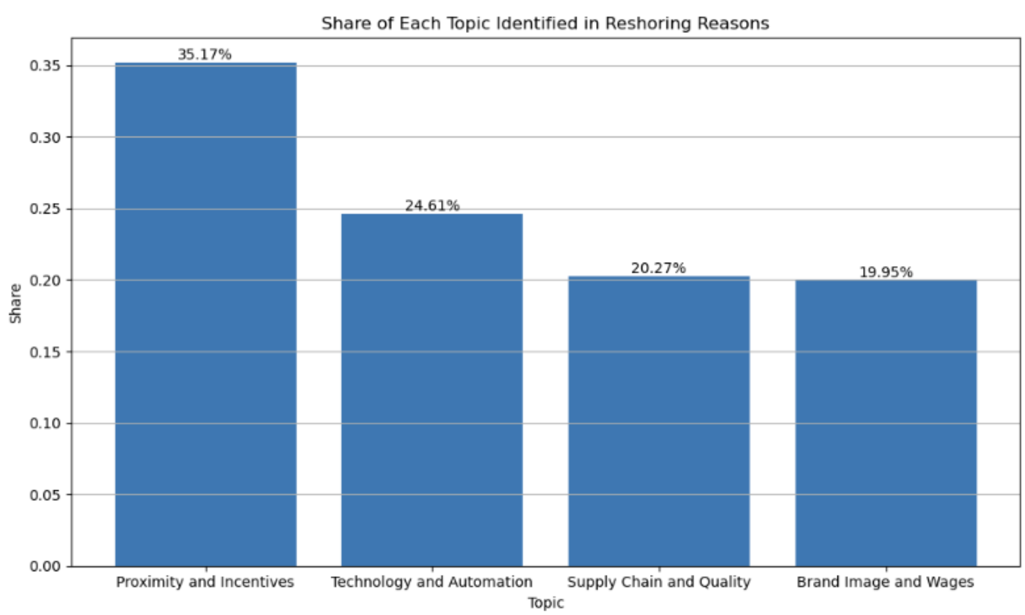

Figure A.4: Share of Each Topic Identified in Reshoring Reasons (LDA Topic Analysis)

Table A.1: Examples of U.S. Companies Reshoring or Canceling Expansion in Mexico due to Technology and Policy Changes

Company	Event	Industry	Short Description	City	Region	Source
Ford Motor Company	Canceled Mexico Plant (Reshoring)	Automotive	Canceled 1.6 billion assembly plant in Mexico; invested 700 million in Michigan for electric/autonomous vehicles.	San Luis Potosí	North-Central	Source
Carrier (UTC)	Canceled Move to Mexico	HVAC Manufacturing	Reversed plans to move Indianapolis furnace plant to Mexico; invested in automation at U.S. factory.	Monterrey (planned)	North	Source
Stanley Black & Decker (Craftsman)	Reshoring to U.S.	Tools Manufacturing	Reshored Craftsman tool production to Texas using robotics instead of expanding abroad.	Multiple (e.g, Hermosillo)	North	Source, Source
EnerSys	Closed Mexico Plant (Reshoring)	Batteries/ Electrical	Closed Monterrey battery facility and shifted production to Kentucky to optimize costs and access U.S. incentives.	Monterrey	North	Source
Samsung Electronics	Reshoring	Home Appliances (Electronics)	Expanded U.S. washer production in South Carolina instead of growing Mexican production.	Querétaro	North-Central	Source
LG Electronics	Considering U.S. Expansion (Cancel Mexico Expansion)	Home Appliances (Electronics)	Considering moving washer and refrigerator production from Monterrey to Tennessee.	Monterrey	North	Source
General Electric (GE Appliances)	Reshoring production to U.S.	Home Appliances	Shifted refrigerator and washer production back to Kentucky from Mexico.	Various	Multiple	Source
Whirlpool Corp.	Reshoring production to U.S.	Home Appliances	Moved commercial washer production from Monterrey, Mexico, to Clyde, Ohio.	Monterrey	North	Source
Horst Engineering	Plant closure and reshoring	Precision Manufacturing	Closed facility in Guaymas, Sonora, moved operations to CT and MA.	Guaymas	Northwest	Source
Caterpillar Inc.	Moved production to U.S.	Heavy Machinery	Transferred truck manufacturing from Escobedo, Nuevo León to Victoria, Texas.	Escobedo	North	Source
General Motors Co.	Supplier reshoring	Automotive	Cut 600 jobs in Mexico by moving parts production to new supplier park in Arlington, Texas.	Silao, Guanajuato	Center	Source

Continued on next page

Table A.1 Continued from previous page

Company	Event	Industry	Short Description	City	Region	Source
Gentex	Reshoring production to U.S.	Motor Vehicle Parts	Closed mirror manufacturing plants in Mexico and China, consolidating production in Zeeland, Michigan, creating 1,600 U.S. jobs.	Not specified	Not specified	Source
Industries	Reshoring production to U.S.	Transportation Equipment	Built new off-road vehicle plant in Huntsville, Alabama, creating 2,000 jobs, partially reversing previous expansion to Monterrey.	Monterrey	North	Source
Otis Elevator (UTC)	Reshoring production to U.S.	Industrial Equipment	Shifted elevator equipment production from Nogales, Mexico, to a modern, automated facility in Florence, South Carolina, consolidating multiple functions previously dispersed internationally.	Nogales	North	Source Source
AmFor Electronics	Reshoring production to U.S.	Electrical Components	Brought wire harness and cable assembly work from suppliers in Mexico and China back to its Portland, Oregon plant to improve delivery, design revisions, and implement lean production techniques.	Not specified	Not specified	Source
Toydozer (Startup)	Reshoring production to U.S.	Toys/Consumer Goods	Shifted plastic toy scoop manufacturing from Mexico to Pendell, Pennsylvania, to reduce costs and address quality issues, leveraging automation and Walmart's Made-in-USA initiative.	Not specified	Not specified	Source
GW Plastics	Reshoring production to U.S.	Medical Manufacturing	Expanded its Tucson, AZ clean-room facility to take over a large medical device assembly program previously done in Mexico, leveraging automated injection molding and packaging capabilities to reduce cost and improve quality.	Querétaro	Central	Source

Continued on next page

Table A.1 Continued from previous page

Company	Event	Industry	Short Description	City	Region	Source
Whirlpool Corp.	Reshoring production to U.S.	Appliances	Shifted production of commercial front-load washing machines from Monterrey, Mexico, to Clyde, Ohio, creating approximately 80–100 U.S. jobs to enhance efficiency and align production with primary markets.	Monterrey	Nuevo León	Source

A.2 Descriptive: Robots

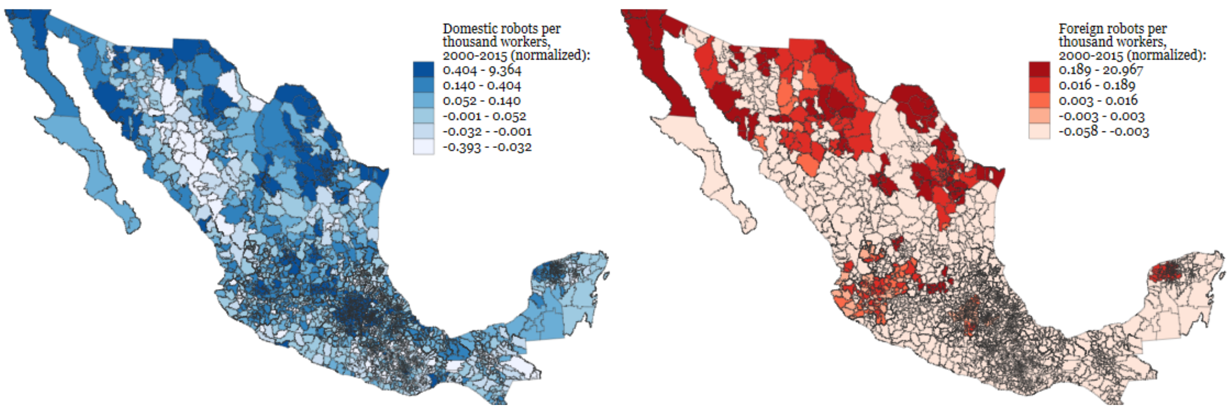

Figure A.5: Commuting zone-level variation in exogenous exposure to domestic and foreign robots, 2000–2015.

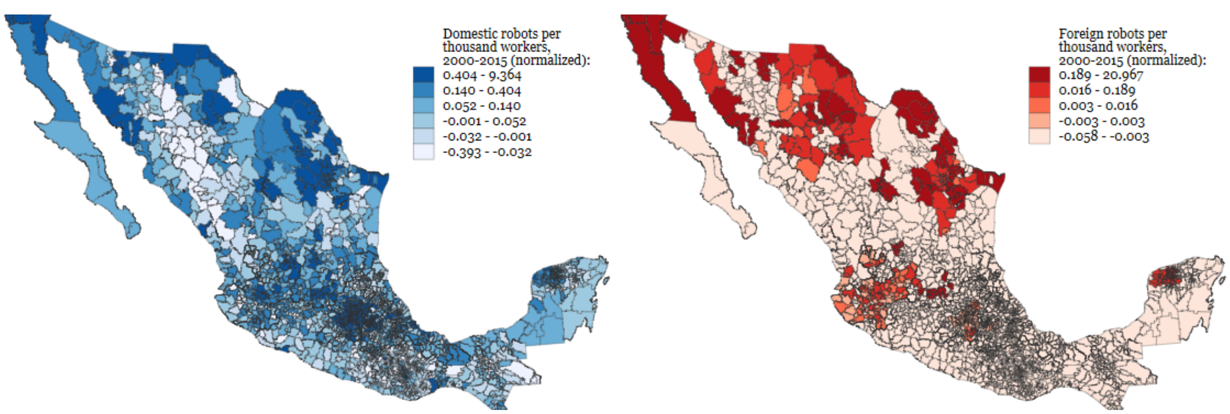

Figure A.6: Commuting zone-level variation in exogenous exposure to domestic and foreign robots, 1993–2015.

A.3 Descriptive: Violence

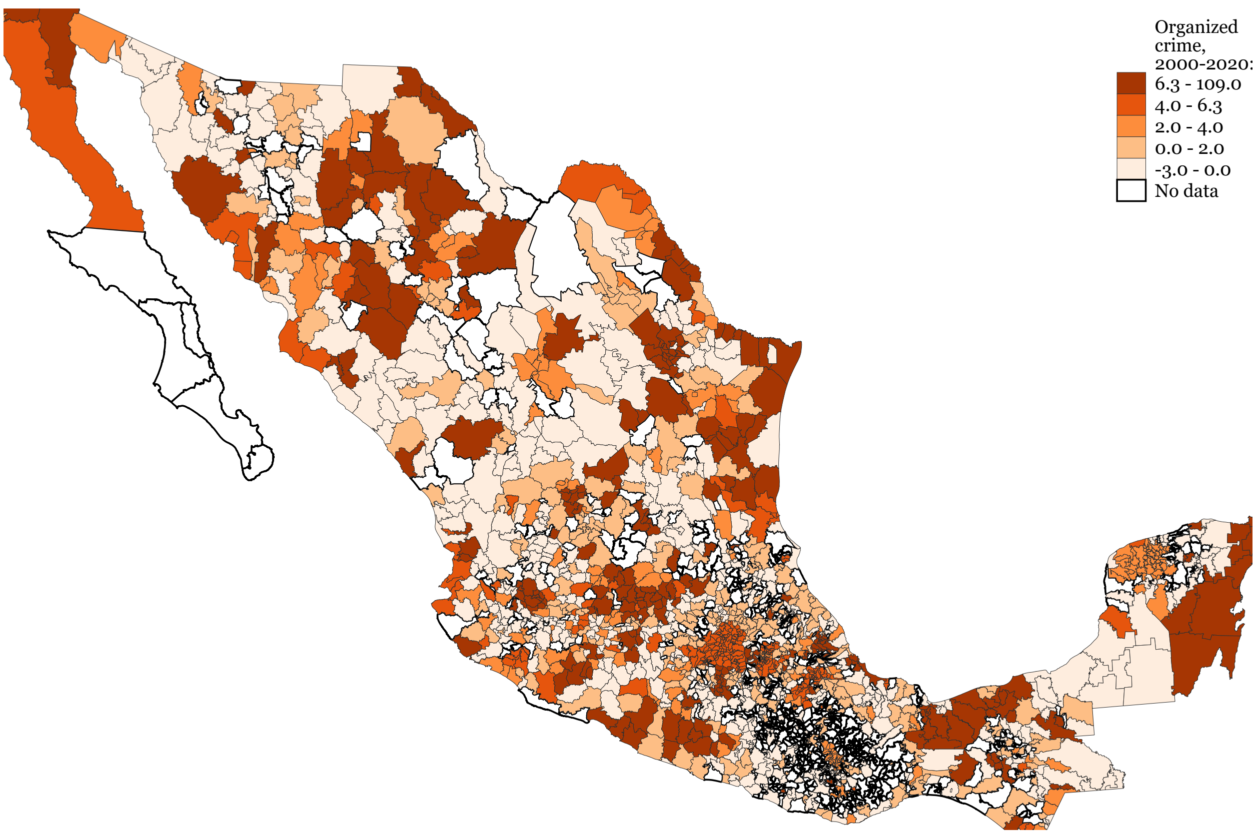

Figure A.7: Commuting zone-level variation in exogenous exposure to domestic and foreign robots, 1993–2015.

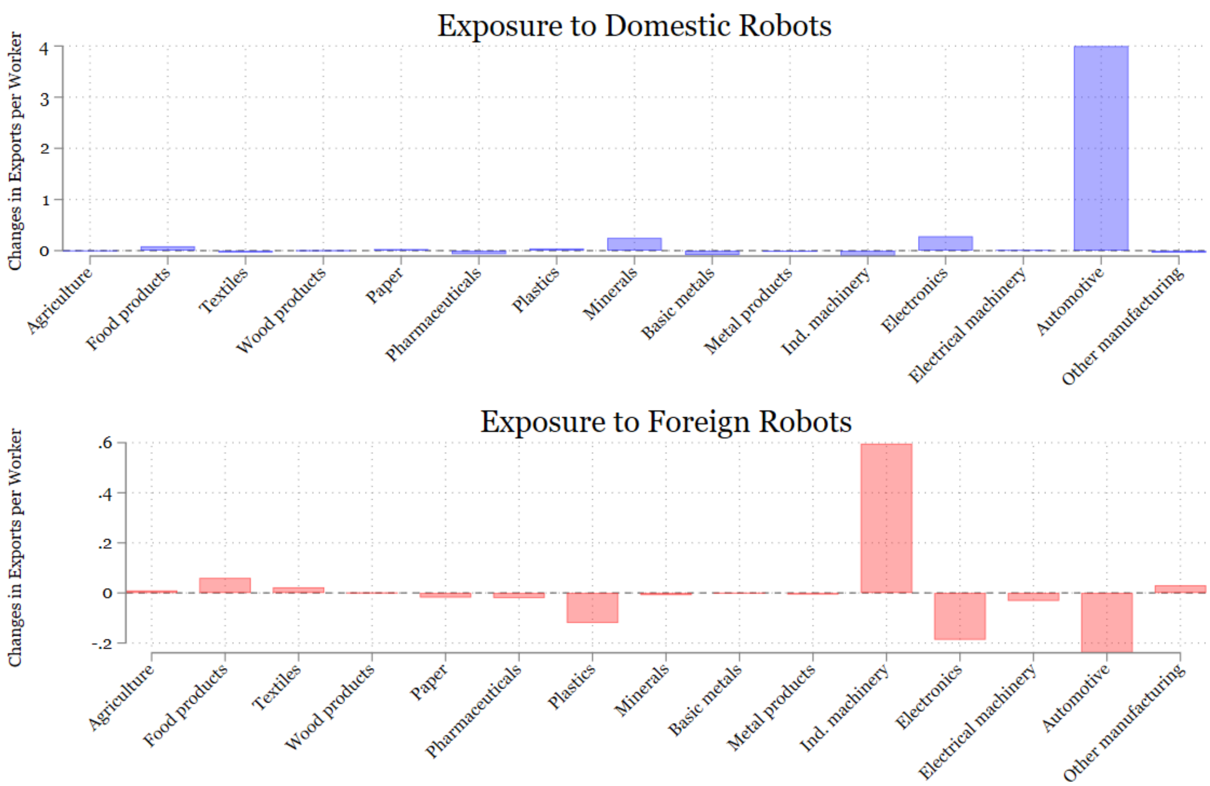

Figure A.8: Changes in exports per worker by industry and their relationship with exposure to domestic and foreign robots, 2000–2015.

A.4 Results: Emigration

	(1) Remittance	(2) Emigrants	(3) Circulate	(4) Emigration
External exposure to domestic robots	7.963	1.611	0.403	0.0594
	(8.812)	(1.629)	(0.382)	(0.0895)
External exposure to foreign robots	-2.420**	-0.508**	-0.202***	-0.0611**
	(0.904)	(0.203)	(0.0641)	(0.0230)
Share of routine workers in 1990	163.3*	34.93**	11.57**	6.154***
	(80.34)	(16.69)	(5.195)	(2.127)
Exposure to Chinese import competition	0.0344	0.139	0.0971	-0.0295
	(1.687)	(0.358)	(0.128)	(0.0478)
Exposure to tariff changes from NAFTA	-41.18	-8.227	-3.506	1.549
	(409.5)	(85.30)	(25.91)	(9.702)
Change in employment-to-population ratio 00-15	-0.815	-0.143	-0.0602	-0.0498***
	(0.603)	(0.108)	(0.0370)	(0.0174)
Share of men in 1990	-352.9**	-50.71*	-8.104	20.88***
	(165.5)	(29.33)	(8.064)	(4.188)
Share of people with primary education in 1990	84.24*	11.06	2.572	-2.033
	(43.69)	(7.639)	(1.805)	(1.373)
Share of manufacturer workers in 1990	13.94	1.598	-0.593	0.406
	(37.97)	(7.383)	(2.027)	(0.874)
Employment to population 1990	-0.773*	-0.162*	-0.0341	0.0408**
	(0.444)	(0.0829)	(0.0258)	(0.0187)
Region	✓	✓	✓	✓
Observations	1805	1805	1805	1796
R^2	0.720	0.702	0.802	0.520

Table A.2: Impact of exposure to robots on Emigration (OLS).

Notes: The dependent variable in columns 1 to 3 refers to the number of households either receiving remittances, having emigrants in the family, or experiencing circular migration. In column 4, the dependent variable refers to the intensity of the emigration index. All specifications include the following control variables: 1) Region: fixed effects for eight broad regions in Mexico; 2) Demographics: 1990 CZ demographics, including the share of men and the share of people with primary education as their highest level; 3) Industry: shares of employment in manufacturing in 1990 and the 1990 level of employment-to-population ratio. All regressions are weighted by a CZ's share of the national working-age population in 1990. Standard errors are robust to heteroskedasticity and clustered by state. The coefficients marked with $***$, $**$, and $*$ are significant at the 1%, 5%, and 10% confidence levels, respectively.

	(1)	(2)	(3)	(4)
	Remittance	Emigrants	Circulate	Emigration
Exposure to domestic robots	7.482	1.514	0.376	0.0544
	(8.152)	(1.505)	(0.353)	(0.0819)
Exposure to foreign robots	-2.678***	-0.562***	-0.223***	-0.0674***
	(0.913)	(0.203)	(0.0611)	(0.0234)
Share of routine workers in 1990	161.1**	34.50**	11.51**	6.164***
	(78.56)	(16.35)	(5.069)	(2.085)
Exposure to Chinese import competition	0.509	0.238	0.135	-0.0186
	(1.590)	(0.338)	(0.121)	(0.0465)
Exposure to tariff changes from NAFTA	-19.53	-3.798	-2.199	1.825
	(400.5)	(83.43)	(25.20)	(9.458)
Change in employment-to-population ratio 00-15	-0.800	-0.140	-0.0589	-0.0493***
	(0.591)	(0.106)	(0.0362)	(0.0170)
Share of men in 1990	-357.0**	-51.57*	-8.366	20.82***
	(160.8)	(28.40)	(7.809)	(4.115)
Share of people with primary education in 1990	81.86*	10.57	2.373	-2.093
	(43.34)	(7.573)	(1.793)	(1.343)
Share of manufacturer workers in 1990	12.98	1.382	-0.739	0.347
	(36.84)	(7.121)	(1.926)	(0.853)
Employment to population 1990	-0.760*	-0.160**	-0.0339	0.0407**
	(0.433)	(0.0811)	(0.0253)	(0.0184)
Region	✓	✓	✓	✓
Observations	1805	1805	1805	1796
R^2	0.721	0.705	0.806	0.522
F	287.6	138.7	137.1	119.6
Kleibergen-Paap Wald F-stat	172.7	172.7	172.7	172.7

Table A.3: Impact of exposure to robots on Emigration (IV).

Notes: The dependent variable in columns 1 to 3 refers to the number of households either receiving remittances, having emigrants in the family, or experiencing circular migration. In column 4, the dependent variable refers to the intensity of the emigration index. All specifications include the following control variables: 1) Region: fixed effects for eight broad regions in Mexico; 2) Demographics: 1990 CZ demographics, including the share of men and the share of people with primary education as their highest level; 3) Industry: shares of employment in manufacturing in 1990 and the 1990 level of employment-to-population ratio. All regressions are weighted by a CZ's share of the national working-age population in 1990. Standard errors are robust to heteroskedasticity and clustered by state. The coefficients marked with $***$, $**$, and $*$ are significant at the 1%, 5%, and 10% confidence levels, respectively.

	(1)	(2)
	Δ Emigration	Δ Emigration
External exposure to domestic robots	0.0252*	
	(0.0129)	
External exposure to foreign robots	-0.0117**	
	(0.00467)	
Exposure to domestic robots		0.0236*
		(0.0123)
Exposure to foreign robots		-0.0129**
		(0.00548)
Nafta/China Shock	✓	✓
Demographics	✓	✓
Industry	✓	✓
Region	✓	✓
Observations	1724	1724
R^2	0.258	0.256
F	23.99	23.56
Kleibergen-Paap Wald F-stat		173.3

Table A.4: Impact of exposure to robots on Changes in Emigration 2000-2020.

Notes: The dependent variable in columns 1 to 3 refers to changes in the intensity of the emigration index between 2000 and 2020. All specifications include the following control variables: 1) Region: fixed effects for eight broad regions in Mexico; 2) Demographics: 1990 CZ demographics, including the share of men and the share of people with primary education as their highest level; 3) Industry: shares of employment in manufacturing in 1990 and the 1990 level of employment-to-population ratio. All regressions are weighted by a CZ's share of the national working-age population in 1990. Standard errors are robust to heteroskedasticity and clustered by state. The coefficients marked with $***$, $**$, and $*$ are significant at the 1%, 5%, and 10% confidence levels, respectively.

	(1)	(2)	(3)	(4)	(5)
	Remittance	Emigrants	Circulate	Emigration	Δ Emigration
Exposure to domestic robots	7.549	1.529	0.372	0.0188	0.0240**
	(8.126)	(1.495)	(0.352)	(0.0680)	(0.0117)
Exposure to foreign robots	-2.708***	-0.569***	-0.221***	-0.0513**	-0.0131**
	(0.898)	(0.206)	(0.0627)	(0.0228)	(0.00552)
Distance to US	-0.00280	-0.000649	0.000166	0.00151**	-0.0000169
	(0.0161)	(0.00315)	(0.00100)	(0.000653)	(0.000100)
Share of routine workers in 1990	162.7*	34.87**	11.42**	5.308***	0.0335
	(83.33)	(17.21)	(5.337)	(2.040)	(0.675)
Exposure to Chinese import competition	0.429	0.219	0.139	0.0243	0.00122
	(1.800)	(0.352)	(0.123)	(0.0354)	(0.00521)
Exposure to tariff changes from NAFTA	-22.57	-4.502	-2.019	3.466	0.446
	(401.1)	(83.43)	(25.29)	(9.020)	(1.069)
Change in employment-to-population ratio 00-15	-0.792	-0.138	-0.0594*	-0.0540***	-0.00699**
	(0.578)	(0.103)	(0.0353)	(0.0179)	(0.00308)
Share of men in 1990	-356.6**	-51.46*	-8.392	20.57***	2.854*
	(159.9)	(28.21)	(7.820)	(4.637)	(1.672)
Share of people with primary education in 1990	81.03**	10.37	2.422	-1.648	-0.350**
	(41.13)	(7.195)	(1.739)	(1.322)	(0.175)
Share of manufacturer workers in 1990	13.13	1.416	-0.748	0.267	0.126
	(36.75)	(7.112)	(1.913)	(0.907)	(0.276)
Employment to population 1990	-0.759*	-0.160**	-0.0339	0.0405**	0.00530
	(0.433)	(0.0810)	(0.0253)	(0.0186)	(0.00342)
Region	✓	✓	✓	✓	✓
Observations	1805	1805	1805	1796	1724
R^2	0.721	0.705	0.806	0.530	0.256
F	254.7	126.5	132.3	91.69	24.90
Kleibergen-Paap Wald F-stat	165.0	165.0	165.0	165.0	165.5

Table A.5: Impact of exposure to robots on Emigration (IV), adding distance to the US as a control variable.

Notes: The dependent variable in columns 1 to 3 refers to the number of households either receiving remittances, having emigrants in the family, or experiencing circular migration. In column 4, the dependent variable refers to the intensity of the emigration index. All specifications include the following control variables: 1) Region: fixed effects for eight broad regions in Mexico; 2) Demographics: 1990 CZ demographics, including the share of men and the share of people with primary education as their highest level; 3) Industry: shares of employment in manufacturing in 1990 and the 1990 level of employment-to-population ratio. All regressions are weighted by a CZ's share of the national working-age population in 1990. Standard errors are robust to heteroskedasticity and clustered by state. The coefficients marked with $***$, $**$, and $*$ are significant at the 1%, 5%, and 10% confidence levels, respectively.

A.5 Results: Violence

	(1) Crimes	(2) Homicides	(3) Kidnapping	(4) Narco	(5) Human Traffic
External exposure to domestic robots	-7.017**	-0.781**	-0.0107	-0.792	0.00185
	(3.353)	(0.322)	(0.0189)	(0.559)	(0.00616)
External exposure to foreign robots	0.747	0.211**	0.0100**	0.592**	0.00336**
	(0.718)	(0.100)	(0.00388)	(0.285)	(0.00155)
Share of routine workers in 1990	25.22	-1.203	-0.220	11.57	0.112
	(67.32)	(7.633)	(0.374)	(9.701)	(0.0681)
Exposure to Chinese import competition	0.744	0.135	-0.00376	-0.155	-0.00139
	(1.482)	(0.116)	(0.00465)	(0.188)	(0.00127)
Exposure to tariff changes from NAFTA	290.0	50.15	2.677**	-92.08*	0.902
	(259.8)	(30.44)	(1.264)	(47.31)	(0.661)
Change in employment-to-population ratio 00-15	0.432	0.0414	-0.00140	0.0486	0.000667**
	(0.342)	(0.0354)	(0.00181)	(0.0316)	(0.000285)
Share of men in 1990	25.35	5.305	-0.0305	-2.036	-0.0782
	(177.2)	(21.37)	(0.469)	(17.72)	(0.180)
Share of people with primary education in 1990	1.272	1.205	0.124	3.550	-0.00481
	(23.18)	(2.370)	(0.130)	(3.180)	(0.0550)
Share of manufacturer workers in 1990	-4.299	-0.297	-0.202	3.685	-0.0988*
	(35.94)	(3.470)	(0.243)	(4.730)	(0.0502)
Employment to population 1990	-0.125	-0.0123	-0.00122	0.0775	0.000188
	(0.464)	(0.0480)	(0.00190)	(0.0515)	(0.00107)
Region	✓	✓	✓	✓	✓
Observations	1802	1802	1802	1802	1802
R^2	0.166	0.197	0.130	0.455	0.127

Table A.6: Impact of exposure to robots on Violence (OLS).

Notes: The dependent variable in column 1 refers to the homicide rate, while column 2 refers to the number of homicides per 10,000 population, both sourced from CONAPO. Column 3 refers to the number of narcocrimes per 10,000 population, sourced from CISEN. All specifications include the following control variables: 1) Region: fixed effects for eight broad regions in Mexico; 2) Demographics: 1990 CZ demographics, including the share of men and the share of people with primary education as their highest level; 3) Industry: shares of employment in manufacturing in 1990 and the 1990 level of employment-to-population ratio. All regressions are weighted by a CZ's share of the national working-age population in 1990. Standard errors are robust to heteroskedasticity and clustered by state. The coefficients marked with $***$, $**$, and $*$ are significant at the 1%, 5%, and 10% confidence levels, respectively.

	(1) Crimes	(2) Homicides	(3) Kidnapping	(4) Narco	(5) Human Traffic
Exposure to domestic robots	-6.638**	-0.734**	-0.00981	-0.733	0.00187
	(3.103)	(0.297)	(0.0175)	(0.543)	(0.00580)
Exposure to foreign robots	0.833	0.234**	0.0111***	0.654*	0.00369**
	(0.769)	(0.114)	(0.00397)	(0.336)	(0.00184)
Share of routine workers in 1990	27.96	-0.976	-0.221	11.57	0.109
	(65.75)	(7.501)	(0.366)	(9.645)	(0.0669)
Exposure to Chinese import competition	0.561	0.0930	-0.00555	-0.262	-0.00194
	(1.525)	(0.116)	(0.00451)	(0.214)	(0.00144)
Exposure to tariff changes from NAFTA	274.7	48.10	2.630**	-95.17**	0.897
	(251.3)	(29.40)	(1.221)	(46.88)	(0.641)
Change in employment-to-population ratio 00-15	0.429	0.0402	-0.00147	0.0447	0.000643**
	(0.336)	(0.0345)	(0.00178)	(0.0325)	(0.000279)
Share of men in 1990	28.12	5.695	-0.0205	-1.397	-0.0766
	(172.8)	(20.88)	(0.462)	(17.87)	(0.178)
Share of people with primary education in 1990	2.012	1.413	0.133	4.130	-0.00154
	(22.91)	(2.351)	(0.125)	(3.232)	(0.0547)
Share of manufacturer workers in 1990	-5.141	-0.234	-0.192	4.208	-0.0942*
	(34.73)	(3.406)	(0.231)	(4.807)	(0.0496)
Employment to population 1990	-0.145	-0.0137	-0.00120	0.0783	0.000214
	(0.456)	(0.0468)	(0.00187)	(0.0515)	(0.00104)
Region	✓	✓	✓	✓	✓
Observations	1802	1802	1802	1802	1802
R^2	0.170	0.203	0.132	0.409	0.122
F	12.09	9.267	21.68	6.305	15.00
Kleibergen-Paap Wald F-stat	172.7	172.7	172.7	172.7	172.7

Table A.7: Impact of exposure to robots on Violence (IV).

Notes: The dependent variable in column 1 refers to the homicide rate, while column 2 refers to the number of homicides per 10,000 population, both sourced from CONAPO. Column 3 refers to the number of narcocrimes per 10,000 population, sourced from CISEN. All specifications include the following control variables: 1) Region: fixed effects for eight broad regions in Mexico; 2) Demographics: 1990 CZ demographics, including the share of men and the share of people with primary education as their highest level; 3) Industry: shares of employment in manufacturing in 1990 and the 1990 level of employment-to-population ratio. All regressions are weighted by a CZ's share of the national working-age population in 1990. Standard errors are robust to heteroskedasticity and clustered by state. The coefficients marked with $***$, $**$, and $*$ are significant at the 1%, 5%, and 10% confidence levels, respectively.

	(1)	(2)
	Δ Org. Crime	Δ Org. Crime
External exposure to domestic robots	-2.662**	
	(1.251)	
External exposure to foreign robots	2.640***	
	(0.681)	
Exposure to domestic robots		-2.455*
		(1.283)
Exposure to foreign robots		2.924***
		(0.851)
Nafta/China Shock	✓	✓
Demographics	✓	✓
Industry	✓	✓
Region	✓	✓
Observations	1033	1033
R^2	0.460	0.418
F	13.01	8.272
Kleibergen-Paap Wald F-stat		169.2

Table A.8: Impact of exposure to robots on Changes in Organized Crime 2000-2018.

Notes: The dependent variable is the difference in the number of organized crime reported by Osorio and Beltran (2020). All specifications include the following control variables: 1) Region: fixed effects for eight broad regions in Mexico; 2) Demographics: 1990 CZ demographics, including the share of men and the share of people with primary education as their highest level; 3) Industry: shares of employment in manufacturing in 1990 and the 1990 level of employment-to-population ratio. All regressions are weighted by a CZ's share of the national working-age population in 1990. Standard errors are robust to heteroskedasticity and clustered by state. The coefficients marked with $***$, $**$, and $*$ are significant at the 1%, 5%, and 10% confidence levels, respectively.

	(1) Crimes	(2) Homicides	(3) Kidnapping	(4) Narco	(5) Human Traffic	(6) Δ Org. Crime
Exposure to domestic robots	-6.385**	-0.734***	-0.00717	-0.733	0.000731	-2.798**
	(2.910)	(0.284)	(0.0168)	(0.531)	(0.00605)	(1.246)
Exposure to foreign robots	0.718	0.234*	0.00989***	0.654*	0.00421**	3.082***
	(0.833)	(0.121)	(0.00361)	(0.348)	(0.00183)	(0.826)
Distance to US	-0.0108	-0.0000291	-0.000112	0.00000135	0.0000482	0.0147*
	(0.0222)	(0.00209)	(0.0000835)	(0.00302)	(0.0000548)	(0.00877)
Share of routine workers in 1990	34.05	-0.959	-0.157	11.57	0.0822	49.36**
	(70.73)	(8.062)	(0.373)	(9.586)	(0.0728)	(23.03)
Exposure to Chinese import competition	0.255	0.0922	-0.00875*	-0.262	-0.000570	0.624
	(1.354)	(0.115)	(0.00518)	(0.176)	(0.00167)	(0.827)
Exposure to tariff changes from NAFTA	263.0	48.07	2.508**	-95.17**	0.949	165.1*
	(239.4)	(29.43)	(1.150)	(46.33)	(0.699)	(89.35)
Change in employment-to-population ratio 00-15	0.463	0.0403	-0.00112	0.0447	0.000491	-0.116
	(0.326)	(0.0332)	(0.00173)	(0.0339)	(0.000327)	(0.140)
Share of men in 1990	29.66	5.700	-0.00439	-1.397	-0.0835	-40.75
	(177.4)	(21.05)	(0.459)	(17.97)	(0.177)	(60.58)
Share of people with primary education in 1990	-1.141	1.404	0.100	4.130	0.0126	0.0773
	(25.41)	(2.538)	(0.131)	(3.040)	(0.0432)	(10.44)
Share of manufacturer workers in 1990	-4.576	-0.233	-0.186	4.208	-0.0967*	-9.748
	(34.84)	(3.386)	(0.227)	(4.831)	(0.0515)	(13.61)
Employment to population 1990	-0.144	-0.0137	-0.00119	0.0783	0.000209	-0.187
	(0.448)	(0.0468)	(0.00187)	(0.0514)	(0.00104)	(0.158)
Region	✓	✓	✓	✓	✓	✓
Observations	1802	1802	1802	1802	1802	1033
R^2	0.171	0.203	0.136	0.409	0.127	0.426
F	15.43	9.303	13.01	6.177	11.38	12.34
Kleibergen-Paap Wald F-stat	165.0	165.0	165.0	165.0	165.0	162.0

Table A.9: Impact of exposure to robots on Violence (IV), adding distance to the US as a control variable.

Notes: The dependent variable in column 1 refers to the homicide rate, while column 2 refers to the number of homicides per 10,000 population, both sourced from CONAPO. Column 3 refers to the number of narcocrimes per 10,000 population, sourced from CISEN. All specifications include the following control variables: 1) Region: fixed effects for eight broad regions in Mexico; 2) Demographics: 1990 CZ demographics, including the share of men and the share of people with primary education as their highest level; 3) Industry: shares of employment in manufacturing in 1990 and the 1990 level of employment-to-population ratio. All regressions are weighted by a CZ's share of the national working-age population in 1990. Standard errors are robust to heteroskedasticity and clustered by state. The coefficients marked with $***$, $**$, and $*$ are significant at the 1%, 5%, and 10% confidence levels, respectively.

A.5.1 Results: Death of Despair?

	(1) Sexual Crime	(2) Family Violence	(3) Property Crimes
Exposure to domestic robots	-0.234	-1.529	0.357
	(0.157)	(1.017)	(1.420)
Exposure to foreign robots	0.00658	-0.0426	-0.113
	(0.0472)	(0.521)	(0.390)
Share of routine workers in 1990	0.845	-10.90	24.14
	(3.346)	(20.54)	(16.15)
Exposure to Chinese import competition	0.161^{**}	1.000^{***}	0.460
	(0.0594)	(0.361)	(0.723)
Exposure to tariff changes from NAFTA	12.20	144.0^{*}	-1.928
	(15.23)	(82.60)	(67.68)
Change in employment-to-population ratio 00-15	-0.00856	-0.000150	0.145^{*}
	(0.0157)	(0.0934)	(0.0794)
Demographics	✓	✓	✓
Industry	✓	✓	✓
Region	✓	✓	✓
Observations	1802	1802	1802
R^2	0.499	0.587	0.522

Table A.10: Impact of exposure to robots on other crimes associated with the Death of Despair hypothesis (OLS).

Notes: The dependent variable in column 1 refers to the homicide rate, while column 2 refers to the number of these types of crimes per 10,000 population, both sourced from CONAPO. All specifications include the following control variables: 1) Region: fixed effects for eight broad regions in Mexico; 2) Demographics: 1990 CZ demographics, including the share of men and the share of people with primary education as their highest level; 3) Industry: shares of employment in manufacturing in 1990 and the 1990 level of employment-to-population ratio. All regressions are weighted by a CZ's share of the national working-age population in 1990. Standard errors are robust to heteroskedasticity and clustered by state. The coefficients marked with $***$, $**$, and $*$ are significant at the 1%, 5%, and 10% confidence levels, respectively.

	(1)	(2)	(3)
	Sexual Crime	Family Violence	Property Crimes
Exposure to domestic robots	-0.248	-1.592	0.214
	(0.152)	(1.011)	(1.342)
Exposure to foreign robots	0.0309	0.126	-0.184
	(0.0500)	(0.547)	(0.402)
Share of routine workers in 1990	1.076	-9.278	23.32
	(3.270)	(19.85)	(15.86)
Exposure to Chinese import competition	0.143^{**}	0.873^{**}	0.534
	(0.0597)	(0.389)	(0.776)
Exposure to tariff changes from NAFTA	11.75	140.5^{*}	1.131
	(15.01)	(81.17)	(66.84)
Change in employment-to-population ratio 00-15	-0.00705	0.0102	0.141^{*}
	(0.0153)	(0.0900)	(0.0777)
Demographics	✓	✓	✓
Industry	✓	✓	✓
Region	✓	✓	✓
Observations	1802	1802	1802
R^2	0.498	0.586	0.521
F	26.11	10.43	9.364
Kleibergen-Paap Wald F-stat	172.7	172.7	172.7

Table A.11: Impact of exposure to robots on other crimes associated with the Death of Despair hypothesis (IV).

Notes: The dependent variable in column 1 refers to the homicide rate, while column 2 refers to the number of these types of crimes per 10,000 population, both sourced from CONAPO. All specifications include the following control variables: 1) Region: fixed effects for eight broad regions in Mexico; 2) Demographics: 1990 CZ demographics, including the share of men and the share of people with primary education as their highest level; 3) Industry: shares of employment in manufacturing in 1990 and the 1990 level of employment-to-population ratio. All regressions are weighted by a CZ's share of the national working-age population in 1990. Standard errors are robust to heteroskedasticity and clustered by state. The coefficients marked with $***$, $**$, and $*$ are significant at the 1%, 5%, and 10% confidence levels, respectively.

A.6 Results: Blocked Exit Options

The structural equation model is presented by equations 1-3, where index i refers to subjects. The terms α are intercepts, while ϵ are zero-mean error terms reflecting the impact of unobservable variables. The total effect of X on Y is indicated by c, the direct effect of X on Y is given by d, and the mediated effect can be estimated using the product-of-coefficients method ab or the difference $c - d$. Then, the proportion of the treatment effect explained by each mediator is just the indirect effect divided by the total treatment effect.

$$M_i = \alpha_1 + aX_i + \epsilon_{i1} \tag{1}$$

$$Y_i = \alpha_2 + cX_i + \epsilon_{i2} \tag{2}$$

$$Y_i = \alpha_3 + dX_i + bM_i + \epsilon_{i3} \tag{3}$$

	(1) Emigrants	(2) Homicides	(3) Homicides
External exposure to foreign robots	-0.505***	0.212***	0.189***
	(0.0716)	(0.0328)	(0.0331)
Emigrants			-0.0454***
			(0.0108)
Demographics	✓	✓	✓
Industry	✓	✓	✓
Region	✓	✓	✓
Observations	1805	1802	1802
R^2	0.693	0.198	0.206

Table A.12: Multi-equation regression framework following the Baron-Kenny mediation approach

Notes: The dependent variable in column 1 refers to the share of households with emigrants explained by foreign robots; column 2 refers to the number of homicides per 10,000 population; column 3 has the same DV as column 2. All specifications include the following control variables: 1) Region: fixed effects for eight broad regions in Mexico; 2) Demographics: 1990 CZ demographics, including the share of men and the share of people with primary education as their highest level; 3) Industry: shares of employment in manufacturing in 1990 and the 1990 level of employment-to-population ratio. All regressions are weighted by a CZ's share of the national working-age population in 1990. Standard errors are robust to heteroskedasticity and clustered by state. The coefficients marked with $***$, $**$, and $*$ are significant at the 1%, 5%, and 10% confidence levels, respectively.

A.7 Results: Politics

	(1) Sheinbaum (Left)	(2) Galvez (Right)	(3) Alvarez (Center)	(4) Null
External exposure to domestic robots	0.0192	-0.0164	-0.00280	0.000837
	(0.0119)	(0.0132)	(0.00443)	(0.000602)
External exposure to foreign robots	0.00716**	-0.00446	-0.00267*	0.000172
	(0.00275)	(0.00282)	(0.00150)	(0.000191)
Share of routine workers in 1990	-0.580***	0.682***	-0.104	-0.00225
	(0.143)	(0.148)	(0.0842)	(0.0178)
Exposure to Chinese import competition	-0.00679	0.00169	0.00499*	-0.000132
	(0.00585)	(0.00579)	(0.00267)	(0.000328)
Exposure to tariff changes from NAFTA	1.427**	-1.370**	-0.0561	-0.00429
	(0.603)	(0.586)	(0.302)	(0.0716)
Change in employment	-0.000698	-0.0000398	0.000743	-0.0000801
	(0.00101)	(0.000949)	(0.000487)	(0.0000812)
Share of men in 1990	0.420	-0.179	-0.240**	0.0558
	(0.425)	(0.404)	(0.115)	(0.0449)
Share of people with primary education in 1990	0.119	-0.210**	0.0922*	-0.0272**
	(0.110)	(0.0966)	(0.0510)	(0.0122)
Share of manufacturer workers in 1990	-0.0307	0.0448	-0.0136	-0.00160
	(0.0874)	(0.0714)	(0.0481)	(0.00742)
Employment to population 1990	0.00133	-0.00172	0.000375	-0.000325***
	(0.00149)	(0.00126)	(0.000623)	(0.000110)
Region	✓	✓	✓	✓
Observations	1800	1800	1800	1800
R^2	0.534	0.420	0.292	0.328

Table A.13: Effect of Robot Exposure on Electoral Outcomes in 2024 elections (OLS Estimates)

Notes: The dependent variables in columns 1–3 represent each candidate's share of valid votes. Column 4 reports the share of null votes relative to the total number of votes cast. All specifications include the following control variables: 1) Region: fixed effects for eight broad regions in Mexico; 2) Demographics: 1990 CZ demographics, including the share of men and the share of people with primary education as their highest level; 3) Industry: shares of employment in manufacturing in 1990 and the 1990 level of employment-to-population ratio. All regressions are weighted by a CZ's share of the national working-age population in 1990. Standard errors are robust to heteroskedasticity and clustered by state. The coefficients marked with $***$, $**$, and $*$ are significant at the 1%, 5%, and 10% confidence levels, respectively.

	(1) Sheinbaum (Left)	(2) Galvez (Right)	(3) Alvarez (Center)	(4) Null
Exposure to domestic robots	0.0184*	-0.0157	-0.00275	0.000800
	(0.0107)	(0.0120)	(0.00414)	(0.000558)
Exposure to foreign robots	0.00786***	-0.00489*	-0.00294*	0.000189
	(0.00279)	(0.00296)	(0.00159)	(0.000202)
Share of routine workers in 1990	-0.593***	0.692***	-0.101	-0.00274
	(0.139)	(0.145)	(0.0817)	(0.0173)
Exposure to Chinese import competition	-0.00785	0.00231	0.00542**	-0.000155
	(0.00557)	(0.00572)	(0.00269)	(0.000335)
Exposure to tariff changes from NAFTA	1.444**	-1.389**	-0.0542	-0.00315
	(0.577)	(0.566)	(0.291)	(0.0695)
Change in employment	-0.000754	-0.00000311	0.000763	-0.0000816
	(0.000973)	(0.000916)	(0.000477)	(0.0000787)
Share of men in 1990	0.418	-0.176	-0.241**	0.0557
	(0.413)	(0.394)	(0.113)	(0.0439)
Share of people with primary education in 1990	0.126	-0.214**	0.0896*	-0.0270**
	(0.106)	(0.0940)	(0.0500)	(0.0119)
Share of manufacturer workers in 1990	-0.0172	0.0353	-0.0175	-0.00118
	(0.0826)	(0.0688)	(0.0461)	(0.00723)
Employment to population 1990	0.00144	-0.00180	0.000349	-0.000321***
	(0.00146)	(0.00123)	(0.000605)	(0.000107)
Region	✓	✓	✓	✓
Observations	1800	1800	1800	1800
R^2	0.544	0.428	0.294	0.328
F	44.48	51.58	16.85	17.36
Kleibergen-Paap Wald F-stat	172.7	172.7	172.7	172.7

Table A.14: Effect of Robot Exposure on Electoral Outcomes in 2024 elections (IV Estimates)

Notes: The dependent variables in columns 1–3 represent each candidate's share of valid votes. Column 4 reports the share of null votes relative to the total number of votes cast. All specifications include the following control variables: 1) Region: fixed effects for eight broad regions in Mexico; 2) Demographics: 1990 CZ demographics, including the share of men and the share of people with primary education as their highest level; 3) Industry: shares of employment in manufacturing in 1990 and the 1990 level of employment-to-population ratio. All regressions are weighted by a CZ's share of the national working-age population in 1990. Standard errors are robust to heteroskedasticity and clustered by state. The coefficients marked with $***$, $**$, and $*$ are significant at the 1%, 5%, and 10% confidence levels, respectively.

	(1) Morena (Left)	(2) Pan - PRI (Right)	(3) Null
External exposure to domestic robots	0.00200	-0.00430	0.000598
	(0.00391)	(0.00391)	(0.000493)
External exposure to foreign robots	0.00277***	-0.00337***	0.000254**
	(0.00100)	(0.00100)	(0.000127)
Share of routine workers in 1990	-0.440***	0.486***	-0.00905
	(0.0684)	(0.0685)	(0.00865)
Exposure to Chinese import competition	0.00273*	-0.00178	-0.000437**
	(0.00145)	(0.00145)	(0.000183)
Exposure to tariff changes from NAFTA	1.482***	-1.469***	-0.0744*
	(0.319)	(0.319)	(0.0403)
Change in employment-to-population ratio 00-15	0.000188	-0.000628	-0.000119*
	(0.000527)	(0.000527)	(0.0000666)
Demographics	✓	✓	✓
Industry	✓	✓	✓
Region	✓	✓	✓
Observations	1802	1802	1802
R^2	0.717	0.591	0.538

Table A.15: Effect of Robot Exposure on Electoral Outcomes in 2018 and 2024 elections pooled (OLS Estimates)

Notes: The dependent variables in columns 1 and 2 represent each candidate's share of valid votes. Column 3 reports the share of null votes relative to the total number of votes cast. All specifications include the following control variables: 1) Region: fixed effects for eight broad regions in Mexico; 2) Demographics: 1990 CZ demographics, including the share of men and the share of people with primary education as their highest level; 3) Industry: shares of employment in manufacturing in 1990 and the 1990 level of employment-to-population ratio. All regressions are weighted by a CZ's share of the national working-age population in 1990. Standard errors are robust to heteroskedasticity and clustered by state. The coefficients marked with $***$, $**$, and $*$ are significant at the 1%, 5%, and 10% confidence levels, respectively.

	(1) Morena (Left)	(2) Pan - PRI (Right)	(3) Null
Exposure to domestic robots	0.00213	-0.00437	0.000591
	(0.00367)	(0.00367)	(0.000464)
Exposure to foreign robots	0.00302***	-0.00368***	0.000278**
	(0.00108)	(0.00108)	(0.000136)
Share of routine workers in 1990	-0.440***	0.487***	-0.00927
	(0.0675)	(0.0675)	(0.00853)
Exposure to Chinese import competition	0.00228	-0.00124	-0.000477**
	(0.00151)	(0.00151)	(0.000191)
Exposure to tariff changes from NAFTA	1.481***	-1.470***	-0.0738*
	(0.314)	(0.314)	(0.0397)
Change in employment-to-population ratio 00-15	0.000164	-0.000598	-0.000121*
	(0.000520)	(0.000520)	(0.0000657)
Demographics	✓	✓	✓
Industry	✓	✓	✓
Region	✓	✓	✓
Observations	1802	1802	1802
R^2	0.718	0.593	0.539
F	112.0	63.96	51.32
Kleibergen-Paap Wald F-stat	16449.2	16449.2	16449.2

Table A.16: Effect of Robot Exposure on Electoral Outcomes in 2018 and 2024 elections pooled (IV Estimates)

Notes: The dependent variables in columns 1 and 2 represent each candidate's share of valid votes. Column 3 reports the share of null votes relative to the total number of votes cast. All specifications include the following control variables: 1) Region: fixed effects for eight broad regions in Mexico; 2) Demographics: 1990 CZ demographics, including the share of men and the share of people with primary education as their highest level; 3) Industry: shares of employment in manufacturing in 1990 and the 1990 level of employment-to-population ratio. All regressions are weighted by a CZ's share of the national working-age population in 1990. Standard errors are robust to heteroskedasticity and clustered by state. The coefficients marked with $***$, $**$, and $*$ are significant at the 1%, 5%, and 10% confidence levels, respectively.

	(1)	(2)	(3)
	Δ Left	Δ Right	Δ Null
External exposure to domestic robots	0.0141	-0.00204	0.00228
	(0.0661)	(0.0144)	(0.0261)
External exposure to foreign robots	0.0615***	-0.0118**	-0.00297
	(0.0188)	(0.00490)	(0.00630)
Share of routine workers in 1990	3.195*	0.778***	0.311
	(1.598)	(0.237)	(0.355)
Exposure to Chinese import competition	-0.0841**	0.00525	-0.00960
	(0.0391)	(0.00725)	(0.00604)
Exposure to tariff changes from NAFTA	-11.85	-0.974	-2.242
	(7.999)	(0.582)	(1.760)
Change in employment-to-population ratio 00-15	0.00810	-0.00108	0.000791
	(0.0117)	(0.00152)	(0.00244)
Demographics	✓	✓	✓
Industry	✓	✓	✓
Region	✓	✓	✓
Observations	1792	1792	1788
R^2	0.295	0.579	0.327

Table A.17: Effect of Robot Exposure on Electoral Outcomes in Changes between 2000 - 2024 elections pooled (OLS Estimates)

Notes: The dependent variables in columns 1 and 2 measure the change in each party family's share of valid votes between 2000 and 2024. Column 3 reports the change in the share of null votes relative to total votes cast. All specifications include the following control variables: 1) Region: fixed effects for eight broad regions in Mexico; 2) Demographics: 1990 CZ demographics, including the share of men and the share of people with primary education as their highest level; 3) Industry: shares of employment in manufacturing in 1990 and the 1990 level of employment-to-population ratio. All regressions are weighted by a CZ's share of the national working-age population in 1990. Standard errors are robust to heteroskedasticity and clustered by state. The coefficients marked with $***$, $**$, and $*$ are significant at the 1%, 5%, and 10% confidence levels, respectively.

	(1)	(2)	(3)
	Δ Left	Δ Right	Δ Null
Exposure to domestic robots	0.0183	-0.00289	0.00194
	(0.0624)	(0.0132)	(0.0241)
Exposure to foreign robots	0.0672***	-0.0129**	-0.00324
	(0.0203)	(0.00531)	(0.00674)
Share of routine workers in 1990	3.198**	0.777***	0.310
	(1.537)	(0.227)	(0.338)
Exposure to Chinese import competition	-0.0945**	0.00724	-0.00908
	(0.0386)	(0.00699)	(0.00652)
Exposure to tariff changes from NAFTA	-11.93	-0.957*	-2.232
	(7.776)	(0.554)	(1.689)
Change in employment-to-population ratio 00-15	0.00758	-0.000975	0.000815
	(0.0113)	(0.00146)	(0.00238)
Demographics	✓	✓	✓
Industry	✓	✓	✓
Region	✓	✓	✓
Observations	1792	1792	1788
R^2	0.295	0.582	0.327
F	241.2	15.86	128.7
Kleibergen-Paap Wald F-stat	384.0	384.0	384.0

Table A.18: Effect of Robot Exposure on Electoral Outcomes in Changes between 2000 - 2024 (IV Estimates)

Notes: The dependent variables in columns 1 and 2 measure the change in each party family's share of valid votes between 2000 and 2024. Column 3reports the change in the share of null votes relative to total votes cast. All specifications include the following control variables: 1) Region: fixed effects for eight broad regions in Mexico; 2) Demographics: 1990 CZ demographics, including the share of men and the share of people with primary education as their highest level; 3) Industry: shares of employment in manufacturing in 1990 and the 1990 level of employment-to-population ratio. All regressions are weighted by a CZ's share of the national working-age population in 1990. Standard errors are robust to heteroskedasticity and clustered by state. The coefficients marked with $***$, $**$, and $*$ are significant at the 1%, 5%, and 10% confidence levels, respectively.

	(1) Sheinbaum (Left)	(2) Galvez (Right)	(3) Alvarez (Center)
Exposure to domestic robots	0.0196*	-0.0170	-0.00259
	(0.0102)	(0.0117)	(0.00418)
Exposure to foreign robots	0.00747**	-0.00444	-0.00301*
	(0.00311)	(0.00316)	(0.00164)
Distance to US	-0.0000421	0.0000485	-0.00000663
	(0.0000898)	(0.0000814)	(0.0000217)
Share of routine workers in 1990	-0.569***	0.664***	-0.0971
	(0.140)	(0.150)	(0.0801)
Exposure to Chinese import competition	-0.00894*	0.00359	0.00523*
	(0.00543)	(0.00592)	(0.00285)
Exposure to tariff changes from NAFTA	1.425***	-1.364**	-0.0613
	(0.538)	(0.532)	(0.289)
Change in employment-to-population ratio 00-15	-0.000514	-0.000264	0.000785*
	(0.000903)	(0.000893)	(0.000470)
Share of men in 1990	0.445	-0.205	-0.239**
	(0.410)	(0.391)	(0.112)
Share of people with primary education in 1990	0.113	-0.200**	0.0877*
	(0.0986)	(0.0902)	(0.0496)
Share of manufacturer workers in 1990	-0.0147	0.0324	-0.0172
	(0.0837)	(0.0699)	(0.0465)
Employment to population 1990	0.00142	-0.00177	0.000346
	(0.00149)	(0.00127)	(0.000604)
Region	✓	✓	✓
Observations	1800	1800	1800
R^2	0.547	0.431	0.293
F	71.59	49.35	19.83
Kleibergen-Paap Wald F-stat	165.0	165.0	165.0

Table A.19: Effect of Robot Exposure on Electoral Outcomes in 2024 elections (IV Estimates), adding distance to the US as a control variable

Notes: The dependent variables in columns 1–3 represent each candidate's share of valid votes. All specifications include the following control variables: 1) Region: fixed effects for eight broad regions in Mexico; 2) Demographics: 1990 CZ demographics, including the share of men and the share of people with primary education as their highest level; 3) Industry: shares of employment in manufacturing in 1990 and the 1990 level of employment-to-population ratio. All regressions are weighted by a CZ's share of the national working-age population in 1990. Standard errors are robust to heteroskedasticity and clustered by state. The coefficients marked with $***$, $**$, and $*$ are significant at the 1%, 5%, and 10% confidence levels, respectively.

	(1)	(2)	(3)
	Δ Left	Δ Right	Δ Null
Exposure to domestic robots	0.0227	-0.00448	0.00124
	(0.0660)	(0.0135)	(0.0259)
Exposure to foreign robots	0.0633**	-0.0123**	-0.00521
	(0.0248)	(0.00568)	(0.00681)
Distance to US	-0.000362	0.0000681	-0.000151
	(0.000747)	(0.0000891)	(0.000125)
Share of routine workers in 1990	3.220**	0.774***	0.322
	(1.505)	(0.227)	(0.342)
Exposure to Chinese import competition	-0.0990***	0.00829	-0.0105
	(0.0381)	(0.00713)	(0.00700)
Exposure to tariff changes from NAFTA	-11.56	-1.036*	-2.117
	(8.060)	(0.567)	(1.729)
Change in employment-to-population ratio 00-15	0.00795	-0.00114	0.000615
	(0.0109)	(0.00142)	(0.00246)
Demographics	✓	✓	✓
Industry	✓	✓	✓
Region	✓	✓	✓
Observations	1792	1792	1788
R^2	0.295	0.582	0.329
F	26.26	144.6	140.6
Kleibergen-Paap Wald F-stat	325.7	325.7	325.7

Table A.20: Effect of Robot Exposure on Electoral Outcomes in Changes between 2000 - 2024 (IV Estimates), adding distance to the US as a control variable

Notes: The dependent variables in columns 1 and 2 measure the change in each party family's share of valid votes between 2000 and 2024. Column 3 reports the change in the share of null votes relative to total votes cast. All specifications include the following control variables: 1) Region: fixed effects for eight broad regions in Mexico; 2) Demographics: 1990 CZ demographics, including the share of men and the share of people with primary education as their highest level; 3) Industry: shares of employment in manufacturing in 1990 and the 1990 level of employment-to-population ratio. All regressions are weighted by a CZ's share of the national working-age population in 1990. Standard errors are robust to heteroskedasticity and clustered by state. The coefficients marked with $***$, $**$, and $*$ are significant at the 1%, 5%, and 10% confidence levels, respectively.