Importing Inequality? The China Shock and Wage Disparities in Mexico*

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Abstract

This paper examines how rising import competition from China (the so-called "China Shock") affected wage inequality across Mexico's local labor markets (LLMs) from 1990 to 2020. Using a newly harmonized panel of 777 Mexican LLMs and adopting a shift-share instrumental variables strategy based on China's exports to structurally similar countries, we estimate the causal impact of Chinese import exposure on within-region wage dispersion. Contrary to conventional trade theory, we find that increased exposure significantly compresses wage inequality in the short run, particularly by narrowing the lower end of the wage distribution rather than uplifting them with higher wages. A $1,000 increase in predicted local import exposure is associated with a 2.6% decline in the interquartile range and a 4.2% decline in the 90–10 wage gap—entirely driven by contraction in the bottom tail. However, this compression is short-lived. Dynamic estimates reveal a U-shaped adjustment: wage inequality rebounds within a decade as high-productivity firms re-expand and selective out-migration of skilled workers steepens local wage gradients. These results underscore that the distributional effects of trade are both time-varying and mediated by local frictions, such as informality, institutional weakness, and mobility barriers. Our findings highlight the need for complementary policies to ensure trade promotes not only aggregate growth but also inclusive labor market outcomes in developing economies.

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1 Introduction

The rapid rise of China in the global market, termed the "China Shock," was an unprecedented disruption to international trade dynamics. This surge in export dominance was largely unforeseen by the Western world given China's turbulent 20th century experience: marred by colonialism, civil wars, and extreme isolationism under Mao, all within a few decades. However, the extensive economic reforms under Deng Xiaoping's tenure played a major role in this transformation. In effect, China was well-equipped to become the dominant manufacturing exporter due to its comparative advantage in producing manufacturing goods relative to the rest of the world.[1] To illustrate, China's share of global manufacturing exports soared from 3% in 1995 to 10% in 2006 and 20% in 2020 (Baldwin, 2024).

How did this shock impact labor markets across the world? Did inequality improve or worsen? The China Shock enables the re-assessment of the costs of trade on local labor market outcomes, even in a developing context. Less developed countries whose vulnerability to trade shocks grows increasingly important considering their growing presence in global commerce as their share of world merchandise trade increased from 22% in 1964 to 44% by 2023 (UNCTAD, 2024). Even more uncertain are the interactions of such trade shocks with distortions commonly found in developing countries like weaker institutions, larger informal economies, and greater information frictions that characterize developing economies (Atkin and Khandelwal, 2020; Artuc et al., 2015).

These interactions drive the motivation for our paper: What are the short-, medium-, and long-term impacts of a trade shock on inequality in the local labor markets of developing countries? More specifically, does increased import competition worsen wage inequality and regional wage disparities? To answer these questions, this paper examines how Mexican labor markets responded to China's rapid rise in export dominance from 1990 to 2020 (pre-COVID-19).

[1] For a more detailed discussion of China's specialization in exporting manufactures, see Autor et al. (2018).

Conventional trade theory suggests that sustained global trade benefits all parties (in an aggregate sense) by raising incomes, improving welfare, and optimizing production. These gains manifest themselves through heightened competition, technological diffusion, and greater factor mobility through the Ricardian and Heckscher-Ohlin frameworks which served as the foundation of the literature's conventional wisdom (Ricardo, 2014; Heckscher, 1919; Ohlin, 1933; Samuelson, 1948). The Stolper-Samuelson theorem, derived from this framework, argues that trade-induced increases in a good's price should raise the real return to the factor used intensively in its production (Feenstra, 2004). In theory, as developing countries engage in trade, demand for their goods should rise, driving up prices. Since these countries specialize in industries reliant on less-educated labor, wages for low-skilled workers should increase, thereby reducing inequality. Losses should be minimal since workers would relocate from industries/regions that face import competition to those that are export-oriented. Throughout the late 1990s and 2000s, the trade literature gradually reached a consensus that trade was not the primary driver of the decline of the manufacturing sector in the developed world and domestic wage inequality (Wood, 2018).[2] But the empirics have shown otherwise. Only a fraction of displaced workers relocate (between areas or sectors) and many struggle to transition into new employment in both developed and developing contexts.[3] Figure 1 presents a striking case from Mexico: while Chinese import penetration rose steadily from the early 2000s, wage inequality seemed to have declined. This inverse relationship may be spurious or driven by concurrent technological changes that either improved outcomes for lower-skilled workers or displaced them through automation. However, aggregate trends can obscure substantial heterogeneity—specific regions, sectors, or demographic groups may have experienced concentrated losses despite overall gains.

We study this phenomena in the context of Mexico using a dataset (which we refer to as the SIDIE dataset hereafter) produced by Banco de México's EconLab (Aldeco et al.,

[2]For a comprehensive review of the trade-versus-technology debate on inequality, see Helpman (2018).

[3]For developed countries, see Dorn and Levell (2024) for an overview of the literature. For developing countries, Goldberg and Pavcnik (2007) analyzes the late 20th-century experience, while Pavcnik (2017) surveys post-2000 evidence.

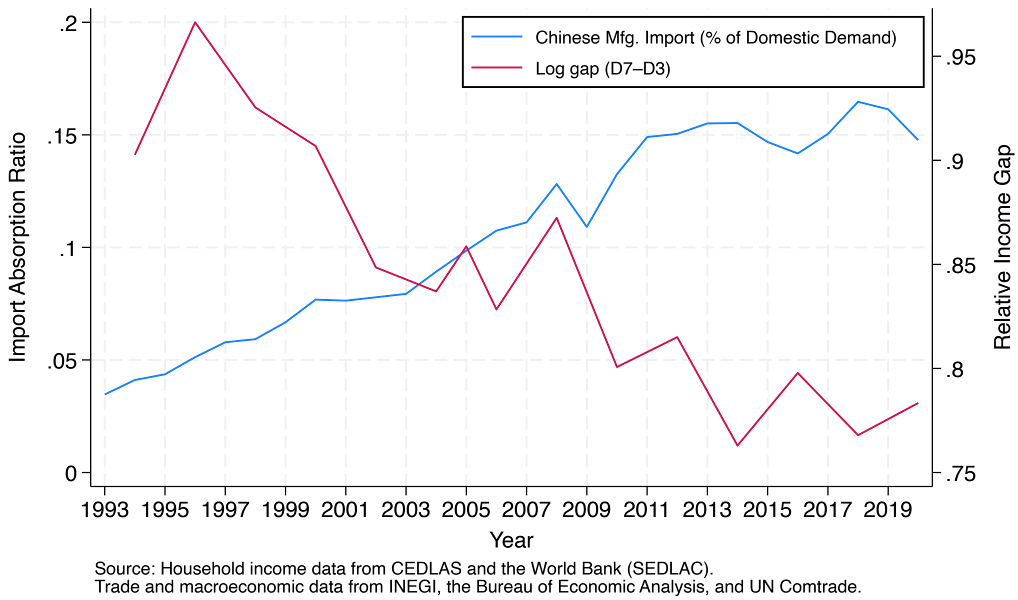

Figure 1: Chinese Import Penetration (Left) and Wage Inequality in Mexico (Right), 1993–2020

2024), which divides Mexico into 777 local labor markets (LLM) using the methodology proposed by Fowler and Jensen (2020), building upon the approach by Tolbert and Sizer (1996) for defining U.S. Commuting Zones. This dataset harmonizes Population and Housing Census data from 1990, 2000, 2010, and 2020, along with the 2015 Intercensal Survey, all collected by Mexico's Instituto Nacional de Estadística, Geografía e Informática (INEGI). The harmonization process facilitates consistent analysis of Mexican local labor markets over the period 1990–2020. They are able to standardize variables on LLMs' demographic composition, employment, labor income measures, social and economic vulnerability, and informality. For data on countries' manufacturing imports, we access the United Nations' Commodity Trade (UN Comtrade) database on import values of goods for Mexico but also for economically similar countries for the construction of our instrument. These imports are classified by the Harmonized Description and Coding System (HS) which which we connect with the censuses' industry classification (which follows the North American Industry Classification System) through the crosswalk provided by the U.S. Census Bureau.

Using this synthetic panel of LLMs, we adopt the empirical strategy of Autor et al.

(2013), as applied in subsequent work by Autor et al. (2014), Acemoglu et al. (2016), Autor et al. (2021), and Autor et al. (2025). We exploit variation in LLM exposure to the China Shock, instrumented using Chinese exports to countries with countries similar to Mexico based on a variety of structural metrics (GDP per Capita, Population, Trade, etc.). Given the long intervals between observations, we estimate long differences using a difference-in-differences approach, eliminating LLM fixed effects while controlling for time fixed effects. This identification strategy allows us to examine how the China Shock affects wage dispersion across LLMs in the short-, medium-, and long-term.

We find that exposure to Chinese import competition has a statistically significant compressive effect on wage inequality across Mexican LLMs. Using a shift-share instrumental variables strategy, we isolate the exogenous variation from the China Shock across 774 LLMs in Mexico from 1990 to 2020. We show that a \$1,000 increase in predicted local import exposure leads to a 2.6% decline in the interquartile range (IQR) of log wages and a 4.2% decline in the 90–10 percentile wage gap. This compression is entirely driven by the bottom of the distribution: the 50–10 percentile gap contracts significantly, while the 90–50 gap remains unchanged. This result suggests that import shocks reduce wage inequality by displacing lower-paid workers, especially in the highly exposed manufacturing-intensive regions.

However, this short-run reduction in inequality does not persist. With a dynamic specification with lagged import exposure measures, the data reveals a pronounced U-shaped adjustment path. While inequality immediately narrows following trade exposure, it eventually rebounds within a decade. Specifically, the standard deviation of log wages decline by 4.3% in the short term but rises by 11.5% in over the medium term. These results reveal two mechanisms: (i) the re-expansion of surviving high-productivity firms that reintroduce wage premia, and (ii) selective out-migration by higher-skilled workers, which worsens the local wage gradient. By the third lag, the estimates become very imprecise, highlighting the limits of long-run inference with this panel of only four time periods. All in all, these findings propose that the distributive impacts of trade are dynamic across time and space, and are mediated by LLM and mobility frictions.

This paper contributes to the growing literature that re-assesses the consequences of trade and globalization on local labor market outcomes (such as wage inequality and employment levels) in developing contexts. We embed ourselves within a subset of this literature which follows the "local labor market approach" of Topalova (2007, 2010) which uses inter-regional variation to estimate the effects of trade shocks on variables of interest. While many of these studies employ trade liberalization as the trade shock of choice (e.g. Dix-Carneiro, 2014; McCaig, 2011; Pierce and Schott, 2016), we instead focus on the sharp rise in Chinese import competition (particularly in manufacturing) as our trade shock of interest. We thus adopt the empirical framework developed by Autor, Dorn, and Hanson and their co-authors (Autor et al., 2013, 2014; Acemoglu et al., 2016; Autor et al., 2021, 2025). However, the existing China Shock literature largely centers on the impacts of trade on average wage and employment levels, often decomposing these effects by worker or firm characteristics and exploring underlying frictions (such as mobility costs (Kovak, 2013; Dix-Carneiro, 2014; Dix-Carneiro and Kovak, 2017) and firm dynamics (Coşar et al., 2016; Ruggieri, 2022; Felix, 2022)). We distinguish our approach by repurposing the methods of this literature to examine trade's role in shaping inequality, specifically by estimating the effect of the China Shock on wage dispersion rather than on average wage outcomes. Through their model of heterogeneous firms, Helpman et al. (2017) argue that within-sector inequality plays a more significant role in overall inequality, calibrating their model with Brazilian data. We distinguish our approach by examining different dimensions of inequality in the context of Mexico while simultaneously exploring a wider breadth of wage inequality. Moreover, we extend this analysis to capture inequality dynamics over the short-, medium-, and long-run angle explored in the context of trade liberalization (Dix-Carneiro and Kovak, 2017), but not yet applied using the China Shock.

We also contribute to the studies analyzing trade's impact on Mexican LLMs. Studies typically use Mexico's waves of trade liberalization as their source of exogenous variation in trade. Specifically, Mexico's 1985 unilateral tariff reductions (Hanson and Harrison, 1999; Bouillon, 2000; Sánchez-Reaza and Rodríguez-Pose, 2002) and the implementation of the North American Free Trade Agreement in 1995 (Chiquiar, 2005, 2008; Esquivel and Rodríguez-López, 2003; Hakobyan and McLaren, 2016). Such studies typically exploits geographic and sectoral variation in pre-shock exposure to trade. Common identification strategies include difference-in-differences, regional tariff instruments, and shift-share designs based on local industry composition. Although studies do highlight heterogeneous impacts across areas, sectors, and worker demographics, the findings on wage inequality remain contradictory. A parallel and expanding line of work examines the impact of the China Shock from the 2000s, adapting the empirical strategy of Autor et al. (2013). In the Mexican context, these studies use variation in regional exposure to Chinese import penetration (instrumented by China's exports to neighboring Latin American markets) to estimate its effects on employment, formality, and wage levels (Mendez, 2015; Chiquiar et al., 2017; Majlesi and Narciso, 2018; Blyde et al., 2020, 2023; Heckl, 2024). While these papers document significant labor market disruptions (especially among lower-skilled workers), most focus on the average outcomes rather than the shock's distributional effects. Our study extends this literature by adapting the established identification strategies to estimate how the China Shock has influenced wage dispersion across regions, sectors, industries, and demographics in the short-, medium-, and long-run.

The remainder of the paper is organized as follows. Section 2 outlines the background of the China Shock and situates it within Mexico's economic context. Section 3 introduces the data and describes the empirical specification. Section 4 estimates the short-, medium-, and long-term effects of the China Shock on wage inequality. Section 5 concludes.

2 Background and Motivating Facts

The China Shock was the culmination of several socioeconomic and geopolitical forces that reshaped China's role in the global economy. This transformation was driven by a series of major reforms initiated by Deng Xiaoping as China's paramount leader whose tenure stood in sharp contrast to that of his predecessor, Mao Zedong. Their key difference was that Deng leveraged market forces to reform the Chinese economy and emphasized regional comparative advantages, whereas Mao pursued a more autarkic model of development (Naughton, 2007). Most discussions on the China Shock attribute its origins from key reforms which enabled greater factor mobility, capital investment in manufacturing, and reducing the role of the state in trade. Specifically, this came in the form of the establishment of export-oriented special economic zones (SEZ), market-oriented policies, and China's accession to the World Trade Organization (WTO), all of which fueled its rapid export growth and global manufacturing dominance (Autor et al., 2018).

China's SEZs were first established in 1980 along the southeastern coastal regions of China to take advantage of their better infrastructure, human capital, and trade links. These SEZs allowed foreign multinational firms to invest and operate there, constructing infrastructure and plants dedicated towards exporting final goods from imported intermediate inputs. These SEZs were able to enjoy special privileges regarding labor regulations, export controls, and investment restrictions that allowed them to prosper (Alder et al., 2016). These SEZs also stood out since these areas saw greater investment in human capital (Lu et al., 2023), foreign direct investment, and wages (Wang, 2013). Such success prompted the creation of even more SEZs, even in the less developed regions of the country. To put this into perspective, the number of SEZs jumped from the initial 4 in 1980 to over 1,600 SEZs by 2010 (Lu et al., 2023).

From this came the second wave of economic reforms that followed Deng's famous southern tour in 1992, some of which were implemented to adhere to WTO provisions for accession (lifting restrictions on foreign direct investment and trade). The most notable of which included uplifting the system that required firms to export goods through state-owned intermediaries and the public subsidies towards state-owned manufacturing firms. Consequently, with smaller, less efficient state-owned enterprises (SOE) being replaced by private manufacturing firms, productivity, output, and competition all grew, allowing the manufacturing sector to mature and develop rapidly. China greatly accelerated its drive to restructure and downsize state-owned and collective enterprises. Over roughly a decade, close to 50 million urban public-sector workers (including those in state-owned and collective firms) lost their jobs—a reduction of about 40% of the public industrial workforce (Naughton, 2007).

Also significant was the partial relaxation of migration restrictions under the hukou system, which originally tied every individual and their legal residence to a specific location. This system bounded people since it determined their access to education, work, and social welfare (Chan and Zhang, 1999). If workers were to try to migrate in spite of this, they would essentially have significantly reduced rights and benefits, outweighing the potential gains of migration. Reforms introduced temporary residence permits, "blue-stamp hukous" (which grants legal urban residence for individuals who purchase property or invest locally), and various municipality-specific policies. Consequently, rural workers then had greater freedom to leave their agricultural homes towards the more lucrative and secure job opportunities in manufacturing-intensive regions. Notably, the number of workers who migrated to urban areas have grown from 25 million in 1985 to 159 million in 2011 (Li et al., 2012).

China was granted the Most-Favored Nation status in the U.S. in 1980 but subject to annual reauthorization by Congress under the Trade Act of 1974. The act actually prohibited trade with nonmarket economies but under the Jackson-Vanik amendment may be waived by the president on an annual basis if it may promote freer emigration from said country. If renewal was not granted, the tariff rate would be as high as 37% in 1999 compared to the preferential 4%. This uncertainty disincentivized Chinese firms from making export-oriented investments that were typically U.S.-bound (Pierce and Schott, 2016). China's accession into the WTO was able to quell such uncertainty. This benefit supplemented the more immediate advantages of WTO membership such as reduced tariffs on imported intermediate inputs along with special agreements among members. Examples include the Multi-Fiber Agreement which eliminated export quotas for textiles and apparel (Khandelwal et al., 2013) or the Information Technology Agreement which removed tariffs on a wide range of information technology goods (Borrus and Cohen, 1998).

All of these reforms shaped the Chinese manufacturing sector to the exporting giant it has been in the 21st century. Both developed and developing countries alike have been affected. Though the associated costs manifest through different channels, reflecting the distinct structural distortions present at various stages of development, including Mexico.

Mexico, although classified as an upper-middle-income country, exhibits structural distortions common in developing economies which drives inequality differently than their developed counterparts. Particularly, these distortions manifest themselves in their large informal economy, relatively weak institutions, and lower total factor productivity (TFP) which may be indicative of frictions to factor mobility.

Informal firms tend to be more inefficient and are ridden with more distortions that drive down workers' marginal product. In doing so, the wages paid out are, on average, lower relative to the formal sector. The formal-informal wage disparity is an apparent driver which further drives wage inequality (La Porta and Shleifer, 2014). Figure 2 plots the kernel density plots of informality rates across Mexican LLMs from the population censuses. A notable pattern emerges as a significant number of LLMs have informality rates higher than 80% illustrating the pervasiveness and persistence of their dual economy.

Institutions also matter in this context since weak institutional frameworks often reinforce existing inequalities– limiting economic opportunities for the poor while enabling the rich to capture more wealth and influence (Chong and Gradstein, 2007). Strong institutions also ensure that labor regulations support firm productivity and allow workers to reallocate efficiently, enabling the labor market to adjust and clear in response to shocks. While there are many measures on the quality of a country's institutions, we highlight the World

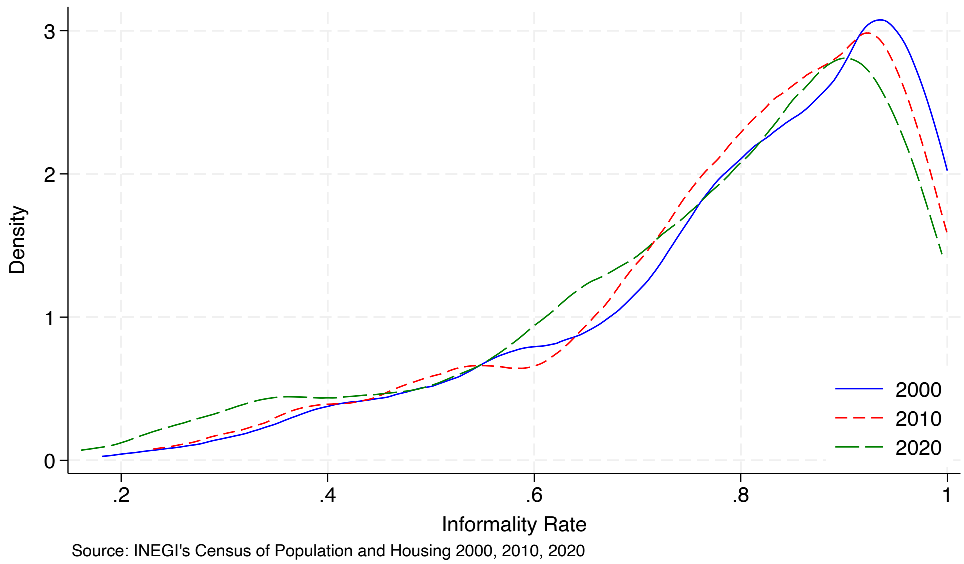

Figure 2: K-Density of Informality Rates among Mexican Local Labor Markets

Bank's Worldwide Governance Indicators to position Mexico relative to the rest of the world. Figure 3 shows that on almost every indicator, Mexico is at best middle of the pack, and at worst close to the bottom when it comes to governance quality. Mexico's rankings have since plateaued or trended downwards, implying limited progress in this respect.

An economy with low TFP may reflect deeper differences in the economy's productive capacities that are characteristic of the developing experience. It may indicate limited access to quality human capital investment or that there exists credit constraints for firms to make optimal investments. These are apparent as, according to the World Bank, Mexico's female labor force participation rate was as low as 47% in 2023, implying potential structural or cultural barriers preventing potentially productive workers into the labor market. Fajnzylber et al. (2009) highlight the significance of credit access to firms and the currently existing constraints present for Mexican firms. Granted that, trade shocks may disproportionately harm smaller, less productive firms and thus drive them out of the market, causing greater within-sector inequality. Figure 4 highlights the prolonged and steady decline of Mexico's TFP since the 1980s.

Together, these structural features are just some of the many frictions salient in Mexico's

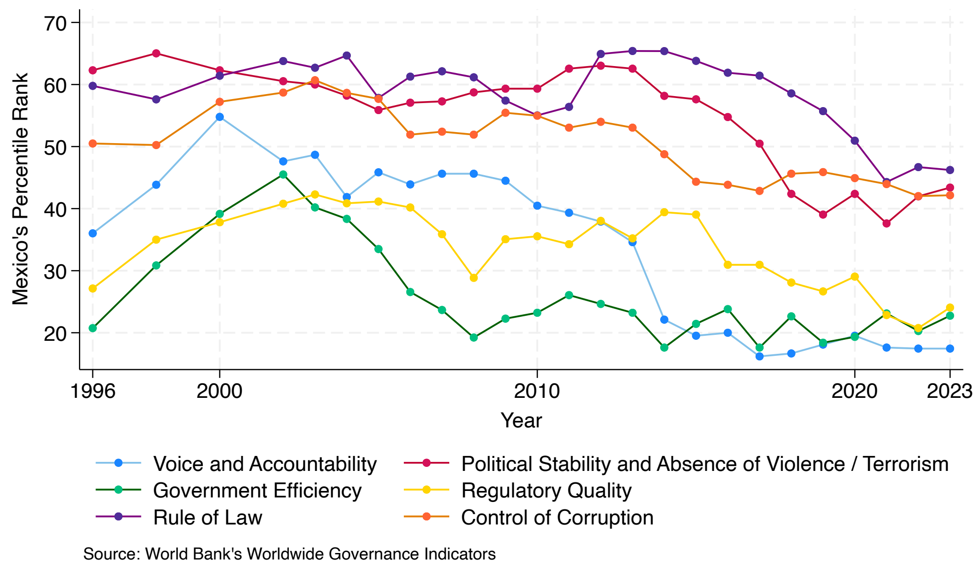

Figure 3: Mexico's Worldwide Governance Indicators from 1996-2023

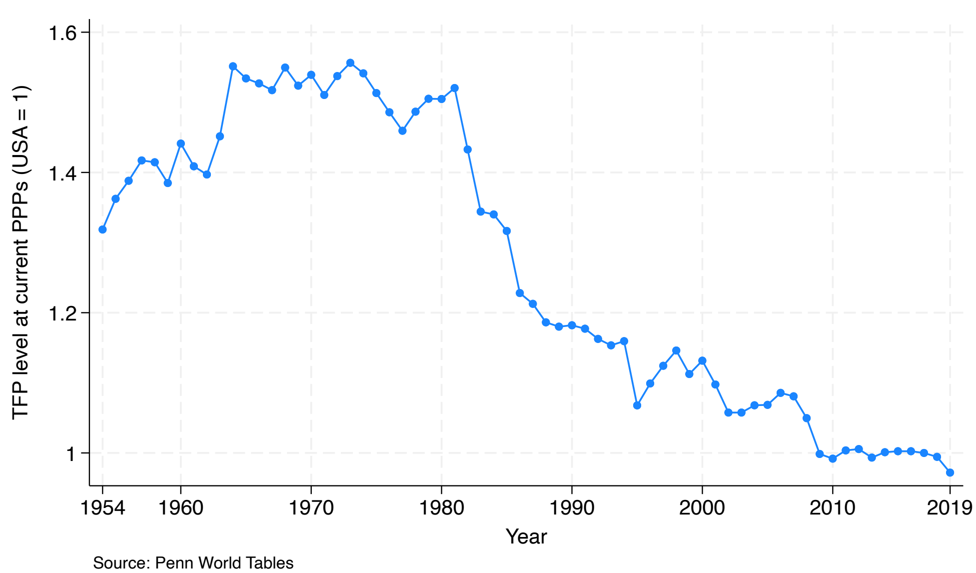

Figure 4: Total Factor Productivity in Mexico (at constant 2017 prices), 1954–2019

labor markets and illustrates its segmented and constrained nature. Unlike in frictionless labor markets, where workers can freely reallocate across firms or regions in response to shocks, the Mexican labor market is shaped by barriers to mobility, uneven enforcement of regulations, and large gaps in firm productivity. These distortions not only drive baseline inequality but also mediate how external shocks, such as rising import competition, propagate across regions and workers. For instance, areas with more flexible institutions or lower informality may be better positioned to absorb displaced workers and adapt to shifting comparative advantages, while others may experience more persistent labor market disruptions. In this context, analyzing the China Shock requires going beyond average effects and instead investigating how its impact varies across local labor markets with different structural characteristics. This motivates our local labor market approach and our focus on the distributional consequences of trade exposure.

3 Empirical Strategy & Data

3.1 Empirical Strategy

To estimate the impact of the China Shock on wage inequality, we adopt an instrumental variable, difference-in-difference framework controlling for LLM and year fixed effects. Specifically, the relationship of interest is expressed in Equation 1:

$$y_{it} = \alpha_i + \beta \,\text{ImportExposure}_{it} + \mathbf{X}'_{it}\gamma + \delta_t + \varepsilon_{it} \tag{1}$$

where y_{it} is a measure of wage inequality, defined as the standard deviation or the interquartile range (i.e. $\sqrt{Var(w_{ijt})}$, $\text{IQR}(w_{ijt})$). $\text{ImportExposure}_{it}$ represents how "exposed" a LLM is to the China Shock. Meanwhile, α_i and θ_t control for the LLM and time fixed effects respectively. $\mathbf{X}_{it}$ represents the matrix of controls that may confound this relationship.

To eliminate α_i, Equation 1 is first-differenced. Meanwhile, time dummies were included

$\mathbf{D}_t$ to control for δ_t. The measure of import exposure used here involves distributing the national-level changes in imports and weighting them across LLMs according to their industry shares, to be then normalized by the LLM's total employment in the initial period of 1990 (Bartik, 1991). Equation 2 defines this measure:

$$\Delta IPW_{it} = \sum_j \underbrace{\frac{L_{ij1990}}{L_{Mj1990}}}_{\text{Sector share}} \cdot \underbrace{\frac{\Delta M_{Mjt}}{L_{i1990}}}_{\text{Imports per worker}} \tag{2}$$

where $\frac{L_{ijt}}{L_{Mjt}}$ represents the employment share of that sector in LLM i and ΔM_{Mjt} is the change in Mexican imports from China.

However this measure of import exposure is potentially endogenous to industry-specific import demand shocks that may heterogeneously impact LLMs due to their varying initial industry employment structure. It may thus artificially drive imports or alter the distribution of employment within these LLMs. To abstract from these, we isolate the supply-driven variation in Chinese import competition by constructing an instrument of import exposure across economically similar economies to Mexico in Equation 3.

$$\Delta IPW_{OCit} = \sum_j \frac{L_{ijt-1}}{L_{Mjt-1}} \cdot \frac{\Delta M_{OCjt}}{L_{it-1}} \tag{3}$$

The key difference in this instrument lies in two adjustments: first, it uses changes in Chinese imports of *other countries* (ΔM_{OCjt}) rather than Mexico; second, it relies on initial LLM employment levels to address simultaneity concerns. This approach helps ensure that the variation in import exposure is plausibly exogenous. As Goldsmith-Pinkham et al. (2020) argue, the validity of this strategy hinges on the assumption that the initial industrial composition of a LLM is not itself a response to anticipated trade shocks. In contrast, contemporaneous employment may already reflect behavioral responses to expected import competition (such as workers leaving manufacturing in more exposed regions). By using lagged employment shares, we mitigate this reverse causality and better isolate the supply-driven component of trade exposure.

So granted these definitions, the estimated equation is defined in Equation 4.

$$\Delta y_{it} = \beta \, \Delta \hat{\text{IPW}}_{it} + \mathbf{X}'_{it}\gamma + \mathbf{D}'_t\boldsymbol{\lambda} + \Delta\varepsilon_{it} \tag{4}$$

The China Shock literature in Mexico has used geographical proximity (South American economies) (Blyde et al., 2023), GDP proximity (other middle-income countries) (Mendez, 2015), or just use the rest of the world (Majlesi and Narciso, 2018; Heckl, 2024). We employ hierarchical clustering for the years 1995-2019 across all countries' total GDP, trade openness, productive capacities index, total population, net trade with China, and imports from China. Figure 5 shows the dendogram of the 50 "closest" countries to Mexico by these metrics. From this, the instrument will make use of import variation from Brazil, Canada, Italy, Poland, Pakistan, Spain, the United Arab Emirates, Singapore, and Indonesia since they are the closest countries to Mexico with complete trade data. Table 1 confirms that our hierarchical clustering has indeed identified economies whose broad profiles closely match Mexico's. Likewise, Table 2 shows that both Mexico and its peer group experienced very similar growth paths in bilateral trade with China between 1995 and 2019. Together, these comparisons demonstrate that the nine countries selected by our clustering algorithm provide a valid, economically comparable counterfactual for isolating the supply-side variation of the China Shock in Mexico.

Variable	**Mexico**	**Selected Countries**
Total GDP (constant 2015 million USD)	985,570.5	804,680.2
Trade Openness (2019 million USD)	325,713.9	276,598.8
Productive Capacities Index (PCI)	47.70	51.84
Population (thousands)	105,099	87,498.52
Net Trade with China (2019 million USD)	−27,521,914	−8,613,658
Average Annual Chinese Imports (2019 million USD)	47,653,429	31,785,176

Table 1: Comparison of economic indicators: Mexico vs. Selected Countries

Source: BACI Trade Database (Gaulier and Zignago, 2010), UNCTAD.

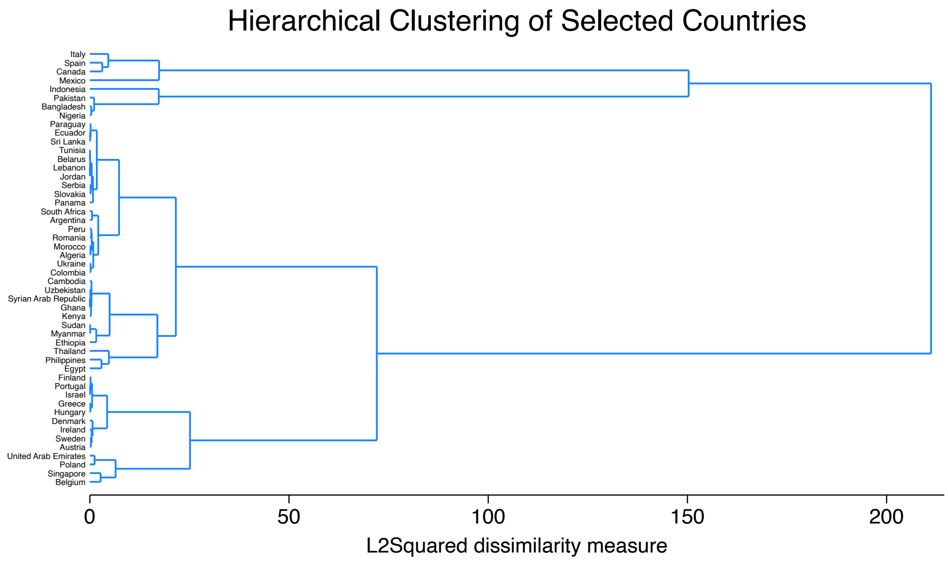

Figure 5: Hierarchical Clustering of Countries

To account for potentially confounding factors that would affect both import exposure and wage inequality across LLMs, we include a set of controls $\mathbf{X}_{it}$. Specifically, we control for the LLM's total population to account for market size and agglomeration effects since larger LLMs could typically have more productive and diverse firms, making them possibly more resilient to any adverse effects brought by the China Shock. Additionally, we also control for the total LLM employment since this would capture the intensity of labor force participation and the availability of labor supply in the LLM which would also capture the scale of economic activity and may thus affect how wage's dispersion amidst the shock. So it is important to control for LLM's exposure to American imports, from which we construct a similar measure as in Equation 2. Finally, we include the LLM's female labor force participation rate to account for gendered patterns in labor market composition considering its significant role in wage inequality.

Meanwhile, to estimate the short-, medium-, and long-term impacts of the China Shock on wage inequality, we lag our instrumented measure of import exposure, keeping the specification largely the same as Equation 4, as is evident in Equation 5:

Table 2: Trade with China

Year	Imports from China (millions USD)	Exports to China (millions USD)
Mexico		
1995	773	308
2000	3,782	644
2010	45,557	6,335
2015	63,950	8,174
2019	78,251	12,071
Other Countries		
1995	2,490	1,738
2000	5,093	2,185
2010	22,328	8,617
2015	25,483	10,936
2019	31,545	13,435

$$\Delta y_{it} = \beta_1\ \Delta \mathrm{IP\hat{W}}_{it-1} + \beta_2\ \Delta \mathrm{IP\hat{W}}_{it-2} + \beta_3\ \Delta \mathrm{IP\hat{W}}_{it-3} + \mathbf{X}_{it}'\boldsymbol{\gamma} + \Delta\varepsilon_{it} \tag{5}$$

where the short-, medium-, and long-term impact should be captured by $\beta_3, \beta_2,$ and β_1 respectively. The time dummies $\mathbf{D}_t$ were omitted since the lagged regressors should already capture any temporal dynamics directly.

3.2 Data Sources

For the analysis, we use trade data from the UN Comtrade database as the primary source of imports of Mexico, U.S., and other countries at the six-digit HS product level. Specifically, we get trade flows for the years 1990, 2000, 2010, 2015, and 2019. 2019 was used instead of 2020 granted the unprecedented impact that COVID-19 had on international trade, so as to prevent the analysis from being contaminated by the extreme effects of the pandemic. For the dispersion of wages, I employ the SIDIE dataset that harmonizes merges and harmonizes INEGI's Housing and Population Censuses for the years 1990, 2000, 2010, 2015, and 2020 (pre-COVID-19). These censuses are conducted every decade to provide the state with detailed socioeconomic data on Mexico's general populace and labor force participation. From these censuses are Aldeco et al. (2024) able to calculate their measure of 777 LLMs using the methodology of Fowler and Jensen (2020) through the use of commuting patterns between municipalities in 2010. Specifically, for each pair of municipalities i and j, a dissimilarity index was calculated D_{ij} which is smaller the more integrated they are in terms of commuting flows:

$$D_{ij} = 1 - \frac{f_{ij} + f_{ji}}{\min(\sum_l f_{il}, \sum_l f_{lj})} \tag{6}$$

where f_{ij} is the number of people who live in municipality i and work in municipality j. The reverse is the case for f_{ji}. So the dissimilarity index is the percent of none-commuters between municipalities divided by the total labor force of the smallest municipality between them. Overall, when there is a lot of commuting such that it approaches the total labor force of the smaller municipality, the dissimilarity index approaches zero, which shows that they are economically integrated. With these dissimilarity indices, municipalities are then grouped by this index using a hierarchical clustering algorithm that initially assumes all municipalities come from one large LLM. From then it slowly divides and distinguishes LLMs from one another to maximize the average differences between the groups, which repeated until 777 LLMs were constructed. 777 was picked specifically as it was the same number of LLMs in a similar paper, Blyde et al. (2020). Aldeco et al. (2024) provide summary statistics of these LLMs in comparison to Blyde et al. (2020) as shown in Table 3. Though, we drop three LLMs to keep the panel balanced, meaning that for each time period, there are 774 LLMs being analyzed.

From this data set, we restrict the analysis to employed, working-age individuals (ages 15-64 years old). From their wages, we calculate the weighted standard deviation and interquartile range of the distribution of their wages as the outcome variable in Equations 4 and 5. The housing and population censuses make use of the North American Industry Classification System (NAICS) to classify what sector individuals were employed in. The

Local labor markets	**Aldeco et al. (2024) Methodology**	**Blyde et al. (2020) Methodology**
Number of local labor markets	777	777
Median number of municipalities in each local labor market	2	1
Maximum number of municipalities in a local labor market	30	74
Maximum number of workers in a local labor market	4,418,922	7,153,860
INEGI 2015 metropolitan areas divided into more than one local labor market	11	16
Proportion of total trips to work that are made within the local labor market	0.942	0.954
Proportion of trips to work that occur within the average local labor market	0.904	0.839
Minimum proportion of trips to work that occur within a local labor market	0.290	0.251

Table 3: Descriptive Statistics of Local Labor Markets and Methodology Comparison

Source: Prepared by the Banco de México with information from INEGI and Blyde et al. (2020).

crosswalk of the U.S. Census bureau bridged the trade data from six-digit HS codes to three-digit NAICS industries.

4 Main Results

Our empirical approach, as detailed in Section 3.1, isolates the supply-side variation in the changes in Mexican imports from China. For the subsequent analysis, we cluster standard errors at the LLM level to account for potential serial correlation within LLMs over time. This approach is standard in the China Shock literature and is appropriate given that the China Shock very plausibly has heterogeneous impacts across observational units (LLMs).

4.1 The Impact of Import Competition on Wage Dispersion

This section presents our core empirical estimates of how exposure to Chinese import competition influenced wage inequality across Mexican LLMs over the period 1990–2020. We first present the OLS estimates to serve as a benchmark before turning to our preferred two-stage least squares (TSLS) specification that should better address the endogeneity concerns by instrumenting Mexican imports per worker using an averaged measure of Chinese imports of economically similar economies.

Table 4 reports OLS estimates of the impact of local import exposure on changes in the within-LLM standard deviation of log wages. Column (1) shows a positive and statistically significant association: a $1,000 increase in a LLM's import exposure per worker corresponds to a 1.6 percentage-point rise in wage dispersion. This relationship remains significant when controlling for baseline LLM characteristics in Column (2), though the magnitude declines modestly. However, once we introduce time fixed effects in Columns (3) and (4), the coefficient on exposure declines sharply and becomes insignificant in the process. This attenuation suggests that the OLS estimates may be driven by broader macroeconomic forces or labor market reforms that are common across LLMs and not necessarily causally linked to trade exposure. These results reinforce the need for an identification strategy that isolates exogenous variation in LLM import exposure.

To address potential endogeneity, we present the TSLS-FE specification's results in Table 5. The first-stage F-statistics across all specifications exceed conventional thresholds (ranging from 18.5 to 39.8), indicating strong instrument relevance. The TSLS estimates reveal a different pattern. In Columns (1) and (2), the effect of trade exposure on the change in the standard deviation of log wages is positive but imprecisely estimated and not statistically significant. Several factors may explain this. First, the combination of first-differencing, time fixed effects, and instrumentation absorbs much of the cross-LLM variation, leaving limited residual movement for import exposure to explain. Second, the within-LLM standard deviation of log wages is inherently noisy (especially after aggregating to the LLM level) and

Table 4: OLS Estimates: Impact of Import Exposure on Change in Wage Dispersion

	(1)	(2)	(3)	(4)
Dependent variable:		$\Delta\, sd(\log w)$		
Local import exposure	0.01578***	0.01386***	0.00314**	0.00135
	(0.00342)	(0.00364)	(0.00123)	(0.00128)
Population (pop)		-7.15×10^{-7}***		-2.99×10^{-7}***
		(1.07e-07)		(6.77e-08)
Total employment		1.66×10^{-6}***		7.14×10^{-7}***
		(2.57e-07)		(1.62e-07)
Female LFP rate		0.29331***		0.12147*
		(0.06326)		(0.05180)
Manufacturing share (1990)		−0.17326**		0.01148
		(0.05976)		(0.04115)
Time fixed effects	No	No	Yes	Yes
Observations	3,096	3,096	3,096	3,096
Centered R^2	0.0283	0.0472	0.4091	0.4127

Robust standard errors clustered by LLM in parentheses;
$^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

clustering further inflates standard errors, reducing our power to detect effects. Finally, by including rich time trends and controls (e.g., demographic and structural characteristics), the specification captures a large share of the systematic variation in wage dispersion, rendering any remaining causal impact of import exposure indistinguishable from zero.

Though, standard deviation of log wages is not the only wage dispersion. Despite these findings, just focusing on the standard deviation may mask important shifts at the tails of the wage distribution which could tell a richer story. We therefore turn to percentile-gap measures of wage inequality, specifically the P90-P10, P50-P10, P90-P50 differences and the interquartile range of log wages to assess whether import competition had heterogeneous effects on upper- and lower-tail wage convergence.

The results in Table 6 indicate that higher import exposure compresses the lower portion of the wage distribution without materially affecting the upper-tail gap. In Column (1), a $1,000 increase in predicted LLM import exposure reduces the IQR of log wages by

Table 5: TSLS Estimates: Import Exposure on First-Differenced Wage Dispersion

	$\Delta\, sd(\log w)$	
	(1) IV	(2) IV with Controls
First-stage F statistic	39.79***	18.45***
Second stage:		
Local import exposure	0.00123	−0.00552
	(0.00202)	(0.00448)
Population	—	-3.32×10^{-7}***
		(9.22e-08)
Total employment	—	8.04×10^{-7}***
		(2.31e-07)
Female LFP rate	—	0.147**
		(0.056)
Manufacturing share (1990)	—	0.071
		(0.061)
Time fixed effects	Yes	Yes
Observations	3,096	3,096
Clusters (LLM)	774	774

Robust standard errors clustered by LLM in parentheses.
***$p < 0.01$, **$p < 0.05$, *$p < 0.10$.

2.6%, implying a pronounced narrowing of the middle 50% of workers. Columns (2) and (3) show similarly large and statistically significant declines in the 90–10 and 50–10 percentile gaps (4.23% and 3.36%, respectively) underscoring that the lower tail is shifting closer to the median. By contrast, Column (4) reports an insignificant coefficient on the 90–50 gap, confirming that distances among top earners remain essentially unchanged. Taken together, these patterns suggest that the compression arises primarily from an improvement (or attrition) at the bottom of the distribution rather than from a contraction of high-end wages. Given that manufacturing, which disproportionately employs lower-wage workers, bore the brunt of Chinese import competition, our findings are consistent with Blyde et al. (2023): import shocks appear to displace or drive out smaller, less-productive firms and their low-paid workers, thereby lifting the bottom rungs of the local wage ladder and narrowing overall dispersion.

Among the controls, neither population nor total employment has a consistent or precisely

Table 6: TSLS Estimates: Import Exposure on Change in Wage Dispersion

	(1)	(2)	(3)	(4)
Dependent variable:	$\Delta\,\mathrm{IQR}(\log w)$	$\Delta(w_{p90} - w_{p10})$	$\Delta(w_{p50} - w_{p10})$	$\Delta(w_{p90} - w_{p50})$
Local import exposure	-0.02565^{**}	-0.04233^{***}	-0.03359^{***}	-0.00874
	(0.00996)	(0.01380)	(0.01088)	(0.00718)
Population (pop)	-8.60×10^{-8}	8.49×10^{-8}	1.01×10^{-7}	-1.65×10^{-8}
	(1.61e-07)	(2.24e-07)	(1.89e-07)	(6.97e-08)
Total employment	2.34×10^{-7}	-1.04×10^{-7}	-1.71×10^{-7}	6.74×10^{-8}
	(4.04e-07)	(5.59e-07)	(4.65e-07)	(1.71e-07)
Female LFP rate	0.2186^{**}	0.5004^{***}	0.4056^{**}	0.0948
	(0.0902)	(0.1479)	(0.1423)	(0.0846)
Manufacturing share (1990)	0.1359	0.4862^{***}	0.5276^{***}	-0.0415
	(0.1041)	(0.1601)	(0.1484)	(0.1087)
Time fixed effects	Yes	Yes	Yes	Yes
Observations	3,096	3,096	3,096	3,096
Clusters (LLM)	774	774	774	774
First-stage F–statistic	18.45^{***}	18.45^{***}	18.45^{***}	18.45^{***}

Robust standard errors clustered by LLM in parentheses.
$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

estimated effect on any dispersion metric. By contrast, higher female labor-force participation is associated with wider wage spreads in the IQR and the two lower-tail gaps (columns (1)–(3)), reflecting the entry of relatively lower-paid workers. The 1990 manufacturing share is positively related to the two lower-tail gaps (columns (2)–(3)), implying that initially more industrialized markets saw greater divergence between middle and lower quantiles as they adjusted to import competition.

Overall, these findings challenge the notion that import competition has a uniform impact across the wage distribution. It highlights the heterogeneous impacts trade shocks have while highlighting its ramifications for those in the lower end of the spectrum, the most vulnerable bear the brunt of adjustment by being laid off. By paying attention to the spatial variation in import exposure, we see that LLMs with the highest exposure experience the sharpest bottom-end compression (precisely where lower-wage manufacturing firms and workers declined) highlighting the adverse effects of trade are concentrated in these most vulnerable regions and workers. Figure 6 illustrates this point with a small group of LLMs that lie far in the right tail of the import exposure distribution, and it is precisely these

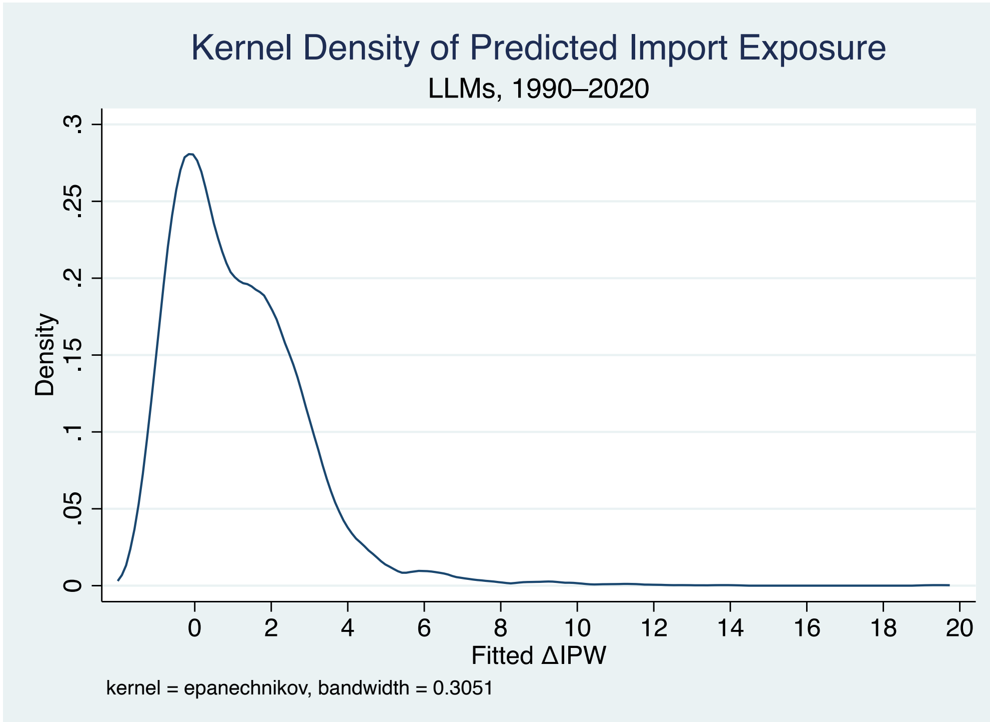

Figure 6: Distribution of Predicted Import Exposure

high-exposure, vulnerable regions that exhibit the sharpest bottom-end wage compressions, underscoring the concentrated adverse effects of trade shocks. From a policy perspective, this underpins the necessity of targeted safety-net and revitalization programs for LLMs that see the worst of such trade shocks to transition into more sustainable industries and to recover displaced workers' potential wages and productive capacities. Moreover, our results shine a light on the need to go beyond the intuitive metrics of wage dispersion and to monitor the lower-tails as a better measure of a LLM's resilience. Standard measures of average income or upper-tail behavior would miss the hardships faced by low-skilled workers amidst the waves of globalization.

4.2 Dynamic Effects: Short-, Medium-, and Long-Term Adjustment Paths

Having shown that Chinese import competition, on average, compresses wage dispersion throughout this period, we next examine whether this effect endures or reverses over time. We estimate the dynamic TSLS specification from Equation 5 and the results appear in Table 7.

Recall that the periods of analysis are 1990-2000, 2000-2010, 2010-2015, and 2015-2020. Thus, the first lag represents the short-term impact, the second the medium-term impact, and the third lag the long-term impact. Column (1) reports the impact of lagged import exposure over only one time period. A \$1,000 increase in LLM import exposure reduces the within-LLM standard deviation of log wages by 4.3%. This finding implies that in the short run, increased exposure to Chinese imports compresses the wage distribution within local labor markets, reducing overall wage inequality. In Column (2), however, we add a second lag. The first lag's compressive effect persists but the second lag flips the sign and reverses it entirely. Wage dispersion actually surges by 11.5%. Two complementary mechanisms can explain this rebound. First, as less productive firms exit the market, surviving high-productivity firms expand and re-establish wage premia, restoring dispersion. Second, selective out-migration of higher-skilled workers from trade-exposed regions may steepen the local wage gradient, as those remaining are either disproportionately low-wage or the unaffected wealthy, thereby widening observed inequality. This rebound mirrors evidence both from the U.S. and Brazilian studies on the China Shock (Dix-Carneiro and Kovak, 2017; Autor et al., 2021).

Column (3) extends the horizon to three lags to capture the full horizon of the China Shock's impacts. However, the inclusion of the third lag seems to have significantly reduced the power and remaining variation as all of the estimates now become statistically insignificant. Notice that with this regression, we fail to reject the joint Wald test, implying that we cannot statistically distinguish the combined dynamic effects from zero in the long run. Though, this imprecision most likely reflects multicollinearity among persistent lags and the limited sample variation to just four time periods, not necessarily substantive long-run divergence. To further supplement this, even replacing the outcome variable with various measures of wage inequality like the different tail convergences yield similar findings (of which are omitted for brevity).

Taken together, the first two columns trace a clear U-shaped adjustment path: import competition initially narrows wage gaps within local labor markets due to lower-skilled workers being laid off, but medium-term reallocation and sorting forces reverse (and potentially overshoot) that compression. Without complementary policies (e.g. migration subsidies for better labor reallocation, human capital investment, incentivizing entrance of high-productivity firms), the short-run "egalitarian" effect of trade shocks dissipates quickly.

5 Conclusion

This paper set out to measure how the "China Shock" has reshaped the distribution of earnings across Mexican LLMs. Exploiting a supply–driven instrument based on Chinese exports to a cluster of economies that most closely mirror Mexico's structural profile, we document a striking U-shaped adjustment in wage dispersion. Import competition compresses wage dispersion by removing lower-skilled manufacturing workers from the equation, but the very same shock widens inequality roughly a decade later as surviving high-productivity firms expand and selective migration and re-sorting accentuate upper-tail gains. By going beyond average outcomes and tracing dynamics out to the medium run, our results nuance the canonical view that trade liberalization in developing economies is unambiguously pro-poor.

The policy message is double-edged. A temporary narrowing of wage gaps seems welcoming but it instead masks deeper structural troubles: the contraction of formal employment, the entrenchment of informality, and the possibility that only a subset of regions and workers move up the value chain in the long term. Sustained and intentional reductions in inequality require complementary interventions that reduce the frictions workers face in reallocating

Table 7: Dynamic 2SLS Estimates: Import Exposure and Wage Dispersion

	Std. Dev. of Log Wages (*sd_loginc*)		
	(1) 1 Lag	(2) 2 Lags	(3) 3 Lags
Import Exposure			
Lag 1 (*ipw*1)	-0.0434^{***}	-0.0365^{***}	0.0430
	(0.0090)	(0.0083)	(0.1156)
Lag 2 (*ipw*2)		0.1152^{***}	0.3159
		(0.0257)	(2.488)
Lag 3 (*ipw*3)			-8.015
			(54.23)
Population	$-6.23\times10^{-7\,***}$	$-2.54\times10^{-7\,***}$	2.21×10^{-7}
	(1.80e-07)	(9.07e-08)	(1.20e-06)
Total Employment	$1.49\times10^{-6\,***}$	$5.89\times10^{-7\,***}$	-5.00×10^{-7}
	(4.61e-07)	(2.02e-07)	(3.31e-06)
Female LFP Rate	0.4110^{***}	0.4033^{***}	0.1180
	(0.0531)	(0.0553)	(0.5070)
Manufacturing Share	0.0998	-0.1353^{**}	-0.0042
	(0.0708)	(0.0675)	(1.303)
Constant	-0.0997^{***}	-0.1121^{***}	0.0545
	(0.0136)	(0.0144)	(0.3431)
Model Stats			
First-stage F-stat	28.70	87.00	48.73
Wald χ^2	94.78	123.35	10.27
Observations	2,322	1,548	774
Clusters (LLM)	774	774	774
p-value (model)	0.000	0.000	0.174

Robust SEs clustered by LLM in parentheses.

$^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$

their labor and moving across LLMs or improving the foundational capabilities of workers to be resilient to shocks that impact industries heterogeneously.

There are several avenues to improve upon this analysis. First, a probit-selection model followed by a Heckman correction would tackle the non-random labor-force exit, ensuring that the observed impact on wages are not primarily driven by attrition. Second, estimating characteristic-specific subsamples of LLMs by gender, education, formality, would reveal whether the U-shape is uniform or masks group-level heterogeneity. Third, a control for LLM's U.S. import exposure is essential given Mexico's deep integration and also the fact that the time period of study coincides with the first U.S.-China trade war. The potential for trade diversion from either side may possibly contaminate the long-run findings of the analysis. Fourth, the hierachical clustering algorithm on selecting "peer" countries could be improved upon with input-output proximity, institutional quality, and automation-related measures to minimize the possible mismatch in the instrument construction. Fifth, aggregating data to the provincial-level may help eliminate the impact of spatial spillovers that LLMs may obscure. Sixth, explicitly controlling for automation or the average capital intensity of a LLM would assist in disentangling the China Shock from the simultaneous technological shocks that also perpetuate skill-biased inequality. Finally, conducting a falsification test using another country as a "pseudo–China Shock" offers a valuable placebo check to assess whether the observed effects are genuinely driven by Chinese import competition or merely reflect transitory shocks within LLMs."

Ultimately, this paper showcases the complex and dynamic interplay of global trade shocks and domestic labor market structures. While globalization offers potential for long-run growth, its distributional effects (especially in developing economies) are far from uniform. A more equitable agenda must go beyond the aggregate and appreciate the spacial concentration and distribution of people and industries. Only then can trade serve as not only a catalyst for growth but also as a vehicle for inclusive prosperity.

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