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OPENNESS AND GROWTH:
A COMPARISON OF THE EXPERIENCES OF CHINA AND MEXICO

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ABSTRACT

In the late 1980s, Mexico opened itself to international trade and foreign investment, followed in the early 1990s by China. China and Mexico are still the two countries characterized as middle-income by the World Bank with the highest levels of merchandise exports. Although their measures of openness have been comparable, these two countries have had sharply different economic performances: China has achieved spectacular growth, whereas Mexico's growth has been disappointingly modest. In this article, we extend the analysis of Kehoe and Ruhl (2010) to account for the differences in these experiences. We show that China opened its economy while it was still achieving rapid growth from shifting employment out of agriculture and into manufacturing while Mexico opened long after its comparable phase of structural transformation. China is only now catching up with Mexico in terms of GDP per working-age person, and it still lags behind in terms of the fraction of its population engaged in agriculture. Furthermore, we argue that China has been able to move up a ladder of quality and technological sophistication in the composition of its exports and production, while Mexico seems to be stuck exporting a fixed set of products to its North American neighbors.

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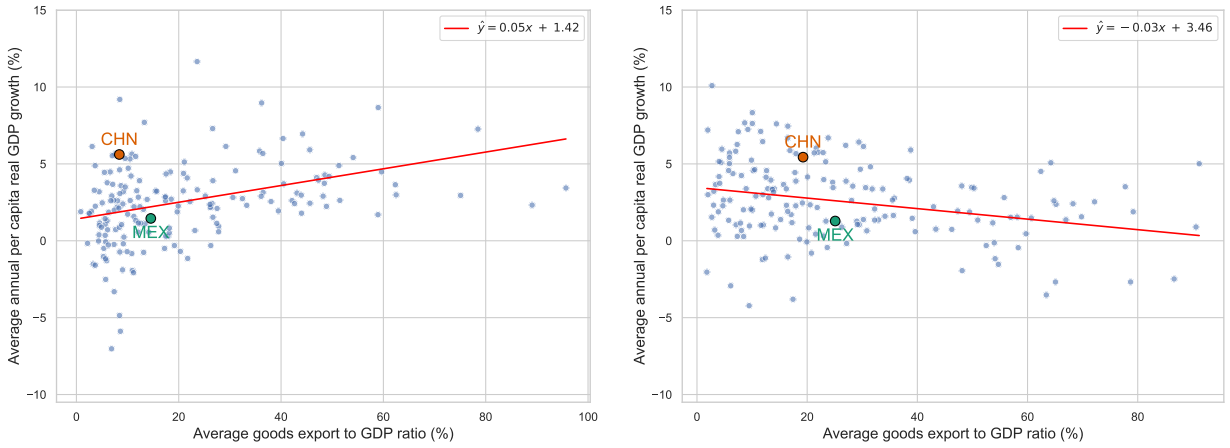
Introduction

Do policies that open a country to international trade and foreign investment generate higher growth in that country? The answer from recent theoretical literature is nuanced. On one hand, some studies provide mechanisms through which openness can foster growth. Integration into global markets facilitates the diffusion of knowledge and technology across borders, expands market size for innovators, and intensifies competition, all of which can raise incentives for innovation and efficiency. See, for example, Grossman and Helpman (2015, 2018), and Perla, Tonetti, and Waugh (2021). On the other hand, other studies such as Ventura (1997) and Bajona and Kehoe (2012) argue that, if growth depends on the accumulation of factors like physical capital and human capital, trade that equalizes the returns to factors across countries can reduce the incentives for a capital-scarce country to accumulate them. As a result, its growth rate is reduced.

There is a large empirical literature that has sought to find a simple causal relationship between openness and growth using large cross-country datasets. See, for example, Rodriguez and Rodrik (2000), Winters and Masters (2013), and Irwin (2025). Like the lessons from the theoretical literature on openness and growth, the lessons from this empirical literature are nuanced. The two scatter plots in Figure 1 show the correlations between trade openness defined by export to GDP ratio and growth defined by average annual growth of real per capita GDP. They provide evidence that any attempt to define a causal relationship between the two must be nuanced: the correlation between trade openness measure and growth is weakly positive from 1986 to 2005, but is negative after 2006.[1] Even so, the coefficients are economically small. In the first scatter plot, for example, a 10 percentage point increase in export to GDP ratio is associated with only a 0.5 percent increase in annual per capita GDP growth.

In this article, we argue that policies that promote openness to international trade and foreign investment are important components of policy packages that produce sustained economic growth in low- and middle-income countries. They also maintain economic growth in high-income countries, although that is not the focus of this article. Policies that promote openness are neither necessary nor sufficient, however, for generating growth at every point in the development path of a low- or middle-income country. The impact of openness policies depends on the timing of the policies in relation to the country's level of structural transformation, the presence or elimination of policies that impede growth, and the adoption of other policies that promote productivity growth.

[1] These results are robust to the exact choice of years; for example, we obtain similar results for 1980–2000 and 2001–2019. They are also robust to using a panel regression with country and year fixed effects.



(a) 1986–2005

(b) 2006–2019

Figure 1: Trade openness and growth

Source: Penn World Table. A dot represents a country's average merchandise export to GDP ratio and real annual per capita growth rate over the time periods; we keep observations with an export to GDP ratio greater than 0 percent and less than 100 percent and a growth rate greater than −20 percent and less than 20 percent; the export to GDP ratio is computed using the nominal values.

We base our arguments on a detailed case study of the economic performances of China and Mexico by revisiting the analysis of Kehoe and Ruhl (2010). Mexico opened itself to international trade and foreign investment in the late 1980s, followed by China in the early 1990s. Although their measures of openness have been comparable, these two countries have had sharply different economic performances: China has achieved spectacular growth, while Mexico's growth has been disappointingly modest. The two plots in Figure 1 show the positions of China and Mexico relative to a large number of other countries, but we would argue that the comparison of China and Mexico has a special relevance because of their sizes and their importance in the world trading system. According to the World Bank, in 2023 China and Mexico were the two middle-income countries with the highest levels of merchandise exports. In fact, China was ranked number 1 in the world and Mexico was ranked number 11. All of the countries ranked between China and Mexico were high-income countries, including South Korea at number 8.

We date the Mexican government's opening of the country to 1990, when it implemented the Brady Plan, which returned it to international credit markets following its 1982 default. We date the Chinese government's opening of the country to Deng Xiaoping's Southern Tour in 1992. Figures 2 and 3 show the growth of exports and foreign direct investment in China and Mexico. Despite similar patterns of opening their economies,

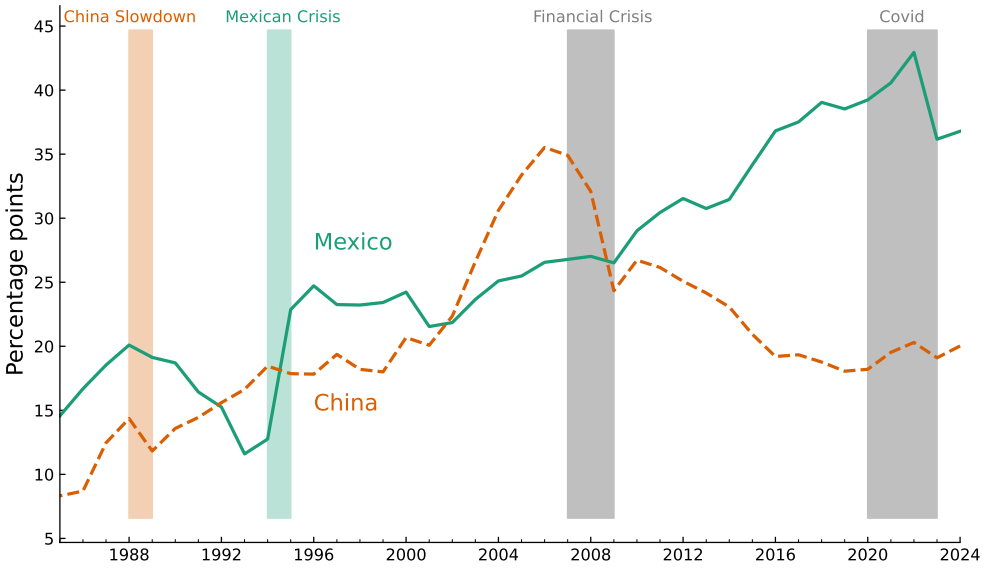


Figure 2: Exports, percent GDP

Source: World Bank.

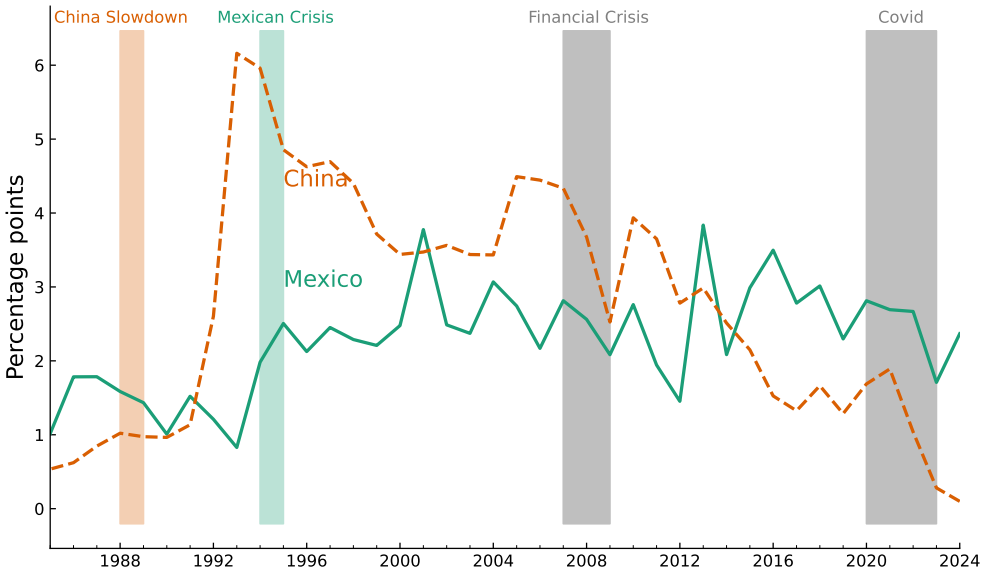


Figure 3: Foreign direct investment, net inflows, percent GDP

Source: World Bank.

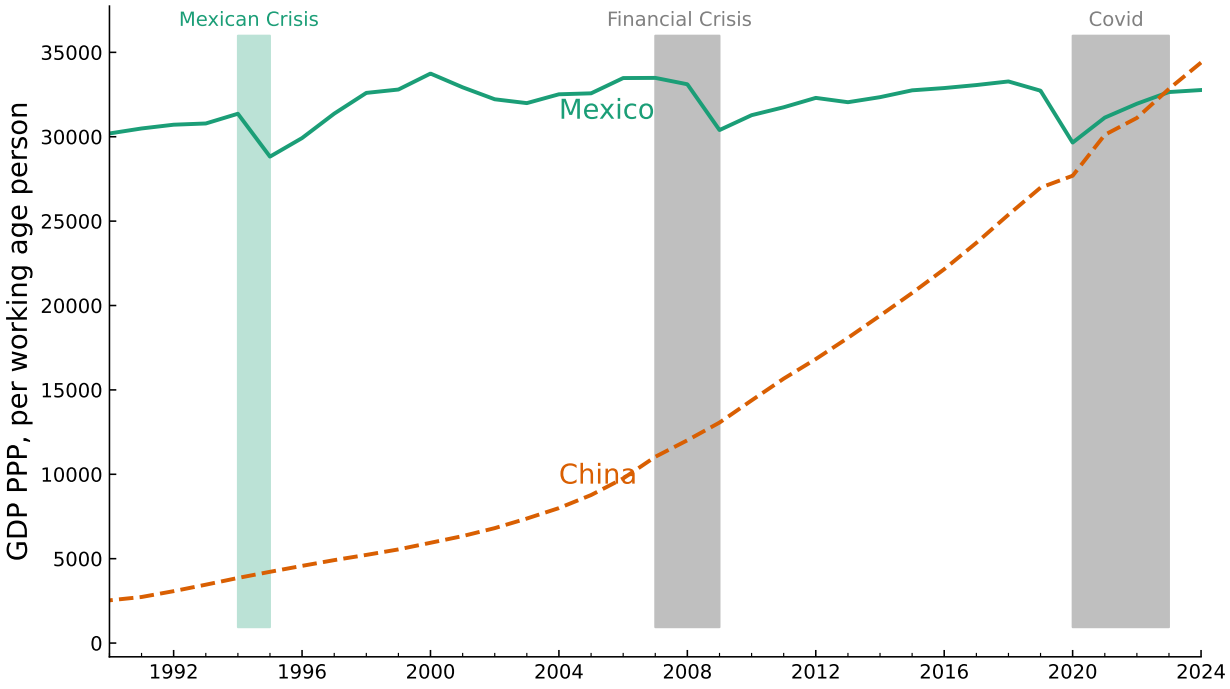


Figure 4: GDP per working age person, PPP adjusted

Source: World Bank; PPP adjusted to 2021 USD.

China and Mexico had very different growth experiences. Figure 4 displays the GDP per working age person of China and Mexico from 1990 to 2024. China started with a much lower GDP per working age person than Mexico in 1990, but has since experienced a remarkable growth trajectory, particularly after joining the WTO in 2001. By 2024, China's GDP per working age person surpassed Mexico's. [2,3] This leads to our first puzzle: Why did openness lead to growth in China but not in Mexico?

The data in Figure 2 and 3 pose a challenge to arguments for a tight link between openness and growth. In Figure 2, we see that Chinese export to GDP ratio has been falling since 2006, following the initial surge after 2001, when China joined the WTO. In contrast, Mexico's export to GDP ratio has been steadily increasing since the 1990s, reaching more than 40 percent in 2024. The data on FDI in Figure 3 tell a similar story. China has become

[2]It is worth mentioning that PPP adjusted GDP for China differs a lot across different sources because of difficulties like adjusting for prices in rural areas (Feenstra, Ma, Neary, and Rao, 2013). For example, the Penn World Table GDP data have China's real GDP per working age person at only 53.3 percent of Mexico's in 2019, compared with 82.4 percent according to the World Bank, suggesting that China had not caught up with Mexico in 2024.

[3]There have also been concerns over Chinese GDP data in recent years because of the political incentives of local governors fighting for promotion (Li and Zhou, 2005; Chen, Chen, Hsieh, and Song, 2019; Xiong and Song, 2024).

less dependent on foreign capital. The data in Figure 4, however, show that GDP per working age person in China has continued to grow more rapidly than that in Mexico, even though its measures of openness have fallen while Mexico's have risen. This leads to our second puzzle: How did China sustain higher growth than Mexico despite less dependence on openness?

To analyze the growth of China and Mexico, we use the framework developed by Parente and Prescott (1994, 2002), Prescott (2002), Kehoe and Prescott, eds (2007), and Costa, Kehoe, and Raveendranathan (2016a,b). In this framework, the industrial leader, which has been the United States during the twentieth century and the first quarter of the twenty-first century, has a trend growth rate driven by productivity growth as a result of improvements in technology and best business practice. Countries like China and Mexico can grow by adopting improvements in technology and best business practice from abroad. Institutions and government policies that prevent or limit the countries' ability to do so are *barriers to riches*, in the terminology of Parente and Prescott (2002). Countries like China and Mexico can speed up their growth rates by improving institutions and government policies. The possibilities for such catch-up growth depend on the distance between productivity in the country and that in the industrial leader. As a country catches up to the United States, further catch-up growth becomes more difficult.

Using this framework, we resolve our first puzzle by arguing that China's opening occurred during its industrialization, to which much of its growth is attributable. By contrast, by the time it opened up, Mexico had gone through its structural transformation and no longer had the tailwind of industrialization. Furthermore, we can identify the barriers to riches that limited Mexico's ability to adopt improvements in technology and best business practice. We do not have a solution to our second puzzle, but we conjecture that China has moved up a ladder of quality and technological sophistication in the composition of its production and exports, which we refer to as the *value chain*, invested in infrastructure, and boosted R&D, while Mexico's growth has been constrained by its reliance on exporting the same products as part of the North American supply chain.

An important topic that we do not address is how the misallocation of resources across firms has changed in China over the past two decades. Hsieh and Klenow (2009) identify this misallocation as a major determinant of the low level of aggregate productivity in China, compared with that in the United States. Furthermore, Bai, Jin, and Lu (2024) argue that opening an economy with large levels of misallocation can lead to welfare losses.

The rest of the article is organized as follows. We begin by proposing a solution to the first puzzle. Next, we hypothesize potential solutions to the second puzzle and revisit

the three barriers to riches suggested by Kehoe and Ruhl (2010) for why Mexico had not grown more and for why they expected Chinese growth to stagnate: an inefficient financial system, a lack of rule of law, and rigidities in the labor market. To conclude, we summarize our key findings and offer avenues for future research.

Why Did Openness in China Coincide with Growth but Not in Mexico?

Historical View

Here, we list some key historical events of China and Mexico's respective timelines of their industrial and trade reforms and compare the early growth and trade openness patterns across the two countries.

Mexico:

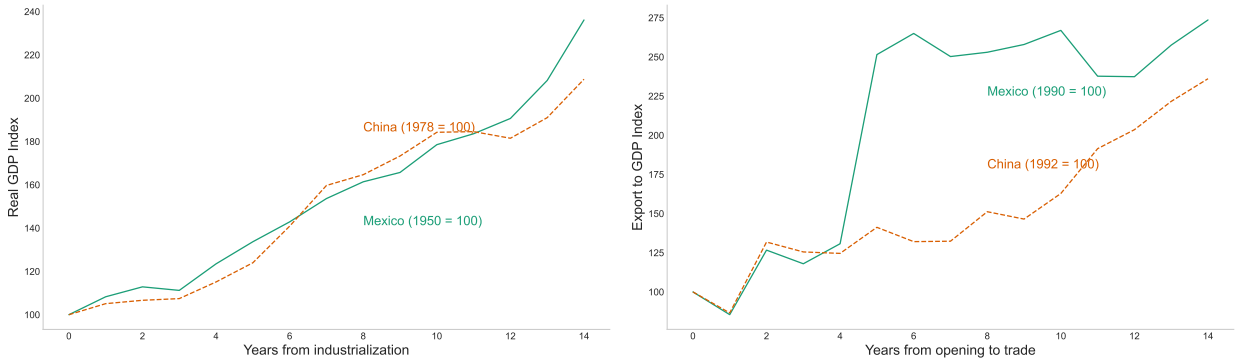
- **1941**: Enactment of Law of Manufacturing Industries to foster industrialization based on import-substitution
- **1965**: Launch of maquiladora plants (foreign owned plants near border with United States) as part of the National Border Industrialization Program
- **1971**: Introduction of export-tax certificates (CEDIS) to rebate duties on imported inputs, especially to maquiladoras, and to diversify export products
- **Mar. 1973**: Enactment of the Foreign Investment Law, which capped foreign equity at 49 percent to protect ownerships of domestic firms
- **Dec. 1979**: Launch of the National Industrial Development Plan (1979–82), which prioritized export promotion and regional decentralization
- **Aug. 1982**: Suspension of payments by the Mexican government on its debts to foreign banks, resulting in Mexico's exclusion from international financial markets
- **1985**: Acceleration of *la Apertura* (opening) of Mexico, reduction of number of products with import license requirements from 65 percent to 10 percent
- **Jan. 1986**: Accession to the General Agreements on Tariffs and Trade (GATT)

- **1990**: Implementation of the Brady Plan to return Mexico to international financial markets.
- **Jan. 1994**: Enactment of NAFTA, removal of tariffs on over 50 percent of U.S.-Mexico trade
- **Oct. 2000**: Enactment of EU-Mexico FTA

China:

- **Dec. 1978**: Inauguration of Reform and Opening Up at Third Plenum of the 11th CCP Central Committee, a sweeping reform that first opened the country to the world but still left the economy centrally planned and state-owned
- **Aug. 1980**: Four Special Economic Zones (SEZs) established (Shenzhen, Zhuhai, Shantou, Xiamen) to attract FDI and pilot export processing
- **Mar. 1986** Launch of the 863 Program to fund key high-tech sectors and reduce reliance on foreign technology
- **Dec. 1990** Establishment of the Shanghai and Shenzhen Stock Exchanges
- **Jan. 1992**: Acceleration of market reforms, privatization, and trade liberalization following Deng Xiaoping's Southern Tour, after an economic slowdown
- **Dec. 2001**: WTO accession, binding deep tariff cuts and embedding China in global value chains
- **Nov. 2008**: 4 trillion RMB stimulus package announced in face of the financial crisis
- **Sep. 2013**: Belt and Road Initiative announced, with massive subsequent infrastructure investments
- **May 2015**: Made in China 2025 Program launched to upgrade manufacturing and promote innovation

Trade liberalization and reforms on foreign investment occurred after early industrial expansion in both countries. In 1950, Mexico began to grow rapidly, following an import substitution development strategy. Kehoe and Ruhl (2010) characterized Mexico's development strategy in the period 1950–1981 as focused on industrialization, urbanization, and expansion of basic education. Kehoe and Meza (2011) point out that Mexico had



(a) Real GDP per capita

(b) Export to GDP

Figure 5: Industrialization and trade liberalization in China and Mexico

Source: Penn World Table. GDP data adjusted to PPP at 2015 USD; base year = 100; base year for GDP index is 1950 for Mexico and 1978 for China; base year for export to GDP index is 1990 for Mexico and 1992 for China.

actually started its industrialization in the late nineteenth century, when Porfirio Diaz was president. This period was followed by the Mexican Revolution and the Great Depression, however, which sidetracked the industrialization process. The industrialization that started in 1950 was characterized by protectionism and restrictions on foreign investment.

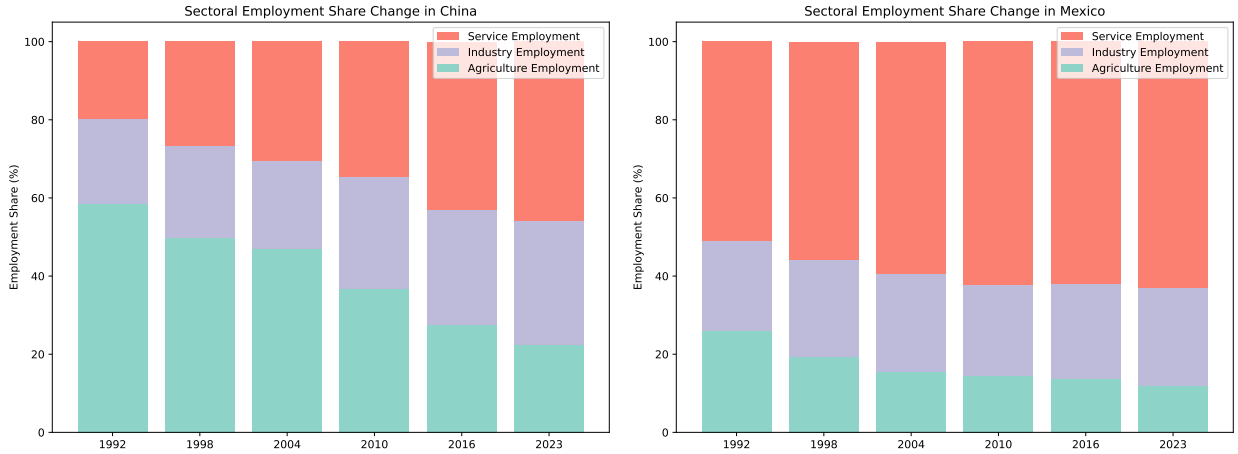
From 1978 onward, China followed a development strategy similar to that of Mexico. The early reforms focused on reducing land collectivization, experimenting with market reforms, and permitting private entrepreneurship. Most of the economy was still closed and dominated by state-owned enterprises (SOEs) until Deng Xiaoping's Southern Tour in 1992.

Figure 5 plots China's and Mexico's patterns of growth and trade openness after industrialization and trade liberalization. The takeaway is that after starting their respective catch-up processes, China and Mexico experienced similar patterns of economic and export sector growth, which is not surprising under the view of a standard neoclassical growth model. Mexico's export to GDP ratio surged after 1994, mainly because of the large devaluation of the peso during the Mexican crisis, and the paths converged over a longer horizon.

Notice that the large-scale trade openness in Mexico came after around 40 years of its industrialization, while openness in China came less than 14 years after industrialization. Each country was at a different stage of its structural transformation when trade openness occurred. Asturias, Hur, Kehoe, and Ruhl (2016) argue that opening to trade before or during industrialization results in a composition of firms best suited to exporting the

country's products, while opening after industrialization is costly because the composition of firms needs to be changed.

Structural Transformation



(a) China (b) Mexico

Figure 6: Sectoral employment share

Source: International Labour Organization

To look at the stages of structural transformation for China and Mexico, we plot the sectoral employment shares from 1992 to 2023 in Figure 6. China was a heavily agriculture-based economy in 1992, when the agricultural sector composed around 60 percent of total employment. Since then, it has gone through significant industrialization and urbanization, and the share has gradually declined to around 20 percent in 2023. The industrial employment share gradually increased from around 20 percent in 1992 to around 40 percent in 2023. The change in service employment share is the most dramatic, increasing from less than 20 percent in 1992 to more than 50 percent in 2023.[4] Mexico has witnessed a similar pattern, but started out with a much larger share of service employment. Urbanization and the structural transition from agriculture to industry and service has been a key driver of China's catch-up growth. We project that the service sector in China will continue to grow in the future, but the gain from the sectoral reallocation will be much

[4] Wang and Conesa (2022) argue that China's high growth rate has been fueled by the large increase in urban labor supply due to rural-urban migration, and economic growth would slow down significantly after 2020 without substantial reforms.

smaller.[5]

Growth Accounting

Figure 7 performs the growth accounting as in Kehoe and Prescott, eds (2007). We use the aggregate production function

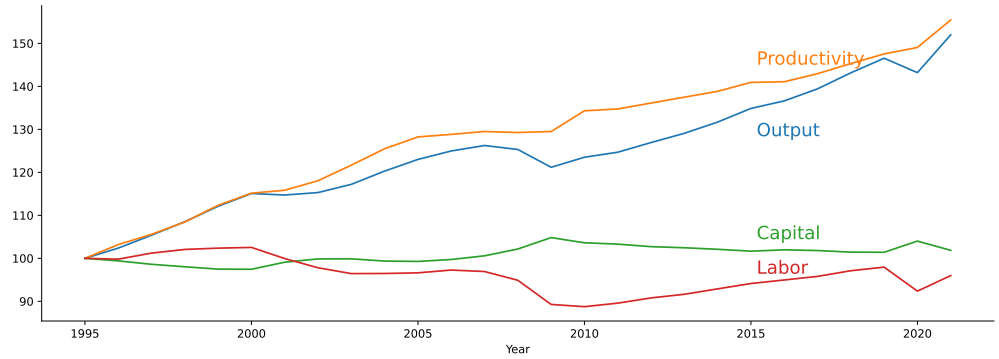
$$Y_t = A_t K_t^{\alpha} L_t^{1-\alpha},$$

and we decompose the growth in output, Y_t/N_t, measured as real GDP per working-age person into a productivity factor, $A_t^{1/(1-\alpha)}$, a capital factor, $K_t/Y_t{}^{\alpha/(1-\alpha)}$, and a labor factor L_t/N_t. To focus on recent periods, we calibrate the parameters using the data only from 1990 to 2023 and set 1995 to be the base year.[6]

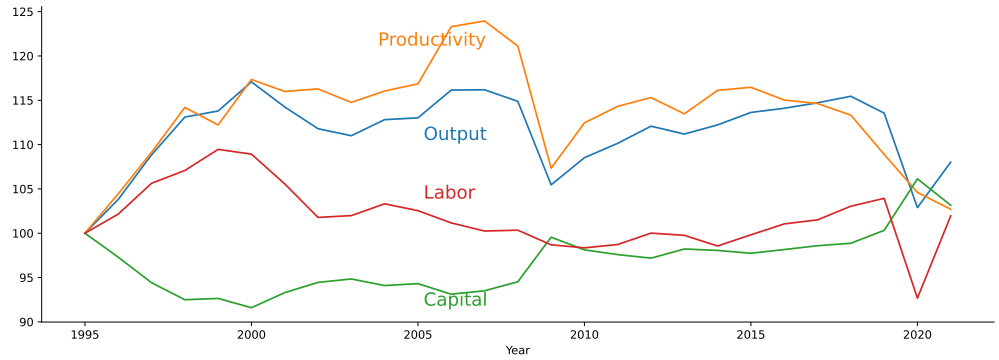
Plot (a) in Figure 7 shows that U.S. growth over the period 1995 to 2023 follows the stylized facts of Kaldor (1961). That is, output growth is driven by productivity growth, and the capital-output ratio and hours worked per working-age person are roughly constant. One respect in which these data for the United States differ from those from 1900 to 2000 is that the recovery from the recession associated with the global financial crisis of 2008–2012 was weak in the sense that it did not bring the U.S. economy back to its trend growth path. See Kehoe (2018). Consequently, the trend growth rate in real GDP per working-age person of the United States may be lower in the twenty-first century than the 2 percent per year rate of the twentieth century. We follow Parente and Prescott (2002) in referring to the United States as the industrial leader during the twentieth century because it was the large country with highest productivity over this period. It is worth noting that, in the nineteenth century, the industrial leader was the United Kingdom, which had a trend growth rate of 1.2 percent per year from 1820 to 1990. Before the nineteenth century—that is, before the Industrial Revolution—no country had sustained growth in per capita income. It is possible that some country will pass the United States as industrial leader in the twenty-first century just as some observers expected Japan to pass the United States towards the end of the twentieth century. It is also possible that the trend growth rate in

[5]Using a neoclassical growth model fitted with Asian Miracle countries, Fernandez-Villaverde, Ohanian, and Yao (2025) project that the Chinese economy will continue to grow at a slower rate with TFP growth flattening out at around 45 percent of U.S. level and income per capita at around 44 percent of the United States. They attribute the slowdown in growth mainly to the end of the TFP catch-up process and the declining population in China.

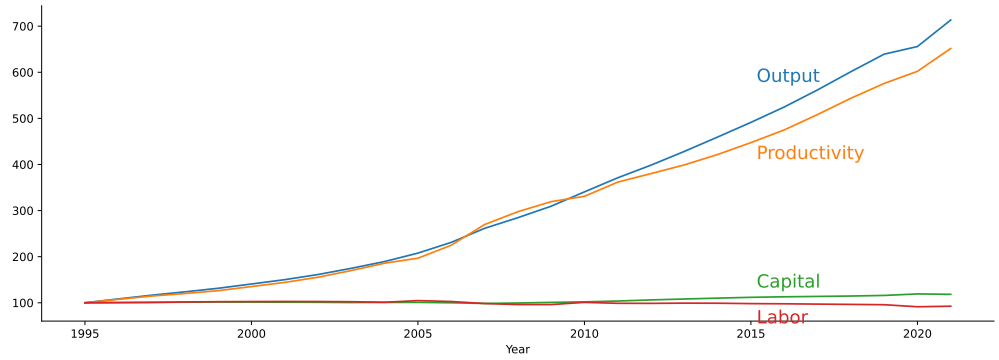
[6]In particular, we fix the labor share to be 65 percent ($\alpha = 0.35$) across the countries. Bai and Qian (2010), however, estimate China's labor share to be around 50 percent. Capital would play a more important role for China's growth if we adopted their calibration.



(a) United States



(b) Mexico



(c) China

Figure 7: Growth accounting

Source: World Bank, Conference Board Total Economy Database, U.S. Bureau of Economic Analysis, and authors' computation.

the twenty-first century for the industrial leader will speed up. So far, however, the U.S. trend growth rate seems to be slowing down.

Plot (b) in Figure 7 shows that Mexico's output growth was also driven by productivity growth between 1995 and 2005. Notice that between 1995 and 2000, Mexico's real GDP per working-age person grew by 3.2 percent per year, and that Mexico suffered more from the Global Financial Crisis than did the United States. Notice too that Mexico has had little recovery afterwards. Looking for barriers to riches to explain Mexico's poor growth performance after 1990, Kehoe and Ruhl (2010) identify three: inefficient financial markets, lack of rule of law, and rigidities in labor markets. The failure to achieve productivity growth is the key distinction in explaining the growth experience in Mexico, relative to that of China and the United States.

Plot (c) in Figure 7 shows China's spectacular growth. The growth in output is also driven mostly by growth in productivity, although there is a substantial contribution from increases in the capital-output ratio after 2012.[7] Kehoe and Ruhl (2010) hypothesized that the same sorts of barriers to riches that held back Mexico's growth would eventually bind on China. They thought that the reason these barriers were not binding in 2010 was that China was still much further behind the United States than was Mexico.

In the next section, we discuss key factors that have contributed to productivity growth in China but not in Mexico. We also revisit the barriers to riches in Mexico identified by Kehoe and Ruhl (2010).

How Did China Sustain Growth Despite Less Dependence on Openness?

Moving Up the Value Chain

We argue that one reason for the different experiences of TFP growth in China and Mexico is that China has been able to move up the value chain, while Mexico has been stuck in manufacturing similar products. By *value chain*, we mean a ladder of products with increasing technological sophistication and increasing quality, as in Young (1991). As a country moves up this ladder in its production and exports and abandons products lower on the ladder, its productivity and measured output increase. Anecdotally, China

[7] We also get a larger contribution of capital to growth if we use a higher depreciation rate. Using data after 1985, we calibrate China's depreciation rate of capital to be around 6.4 percent, while Bai, Hsieh, and Qian (2006) estimate it to be above 10 percent.

has grown from relying on exporting textiles to become the world's largest exporter of solar panels, cars, semiconductors, smartphones, and other technologically sophisticated products, while Mexico's exports are still dominated by assembled automobiles and petroleum products, mostly within the North American supply chain. Our data decompose the product level export of China and Mexico and verify this observation.

Our data also suggest that Mexico is trapped in its trade with the United States. As Mexicans say, "Pobre México, tan lejos de Dios, tan cerca de Estados Unidos" (Poor Mexico, so far from God, so close to the United States.)[8] It is worth pointing out that the same is true of Canada, which has trade that is similarly concentrated on the United States. In fact, Canada and Mexico are the only two large countries in the world that have trade so concentrated on one trading partner.

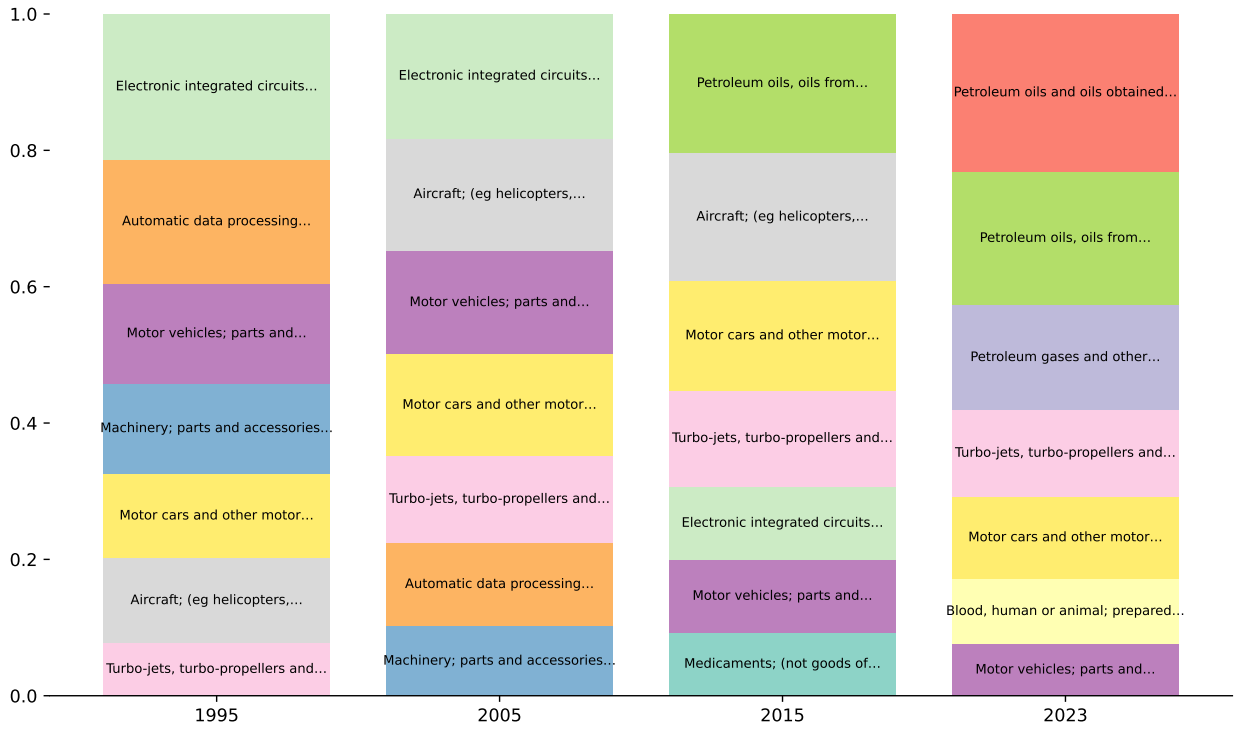


Figure 8: The United States' largest exports by HS4 products

Source: CEPII BACI database.

We compare the export composition of China and Mexico in terms of four-digit Harmonized System classifications (HS4) and their export partners, using the United States as a

[8]This phrase is often attributed to President Porfirio Diaz, but it is actually due to Mexican journalist and academic Nemesio García Naranjo.

reference.[9] Figure 8 to 10 show the composition of the exports of the three countries by HS4 categories. For each year, we display only the top seven HS4 export categories for each country.

We first look at the U.S. export composition as a reference. Figure 8 shows the U.S. largest exports by HS4 categories in 1995, 2005, 2015, and 2023. Two major shifts in the U.S. export composition can be observed from the figure. First, the United States was the largest exporter of electronic devices and machinery in the world in 1995, but its exports have become less dependent on these products. Second, petroleum oils and gases emerged as a major part of U.S. exports, owing to fracking. Apart from these changes, aircraft and cars have been two main export categories of the United States throughout the years.

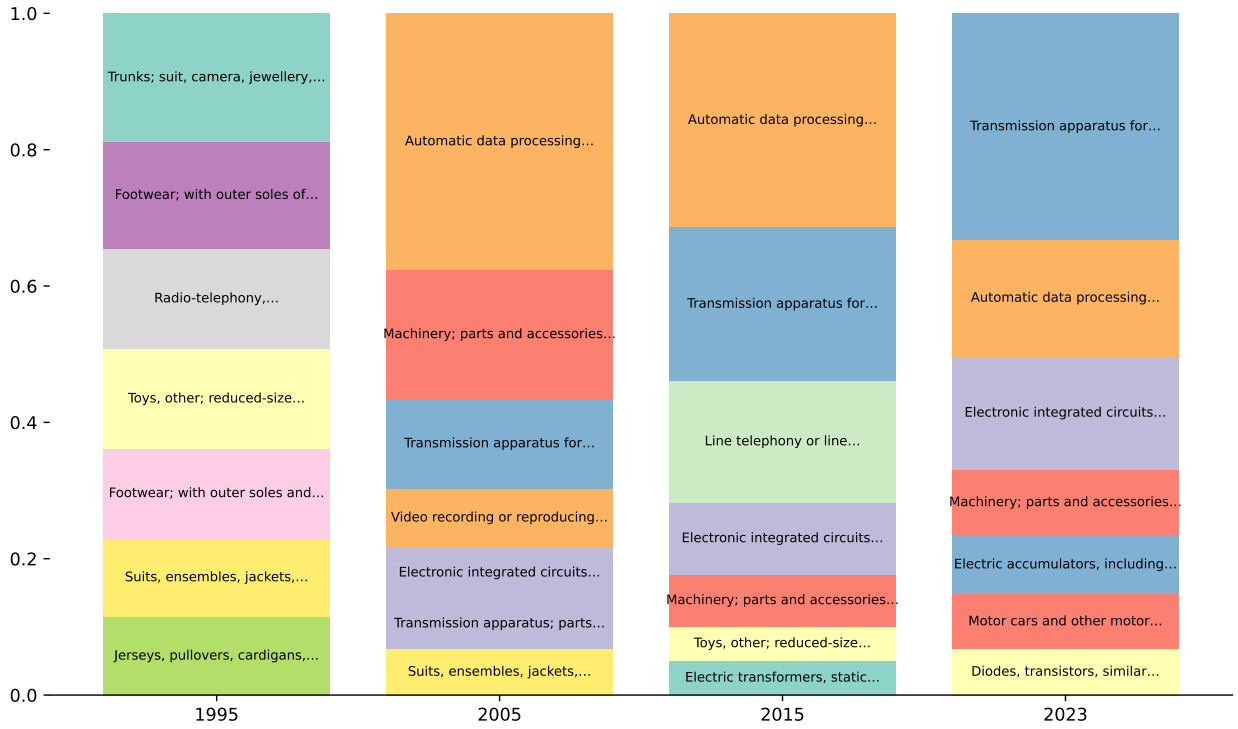


Figure 9: China's largest exports by HS4 products

Source: CEPII BACI database; we exclude exports of China's mainland to Hong Kong.

Figure 9 displays China's largest exports by HS4 categories over the same years. China's export sector has shifted dramatically, moving from a focus on consumer accessories,[10]

[9] For consistent comparison across the years, we use the 1992 version of the Harmonized System categorization of exports, which is composed of 1,242 HS4 categories and 6,381 HS6 products. It is worth noting that some of the categories have been renamed or discontinued in more recent versions of the system.

[10] The full description of the top HS4 export of China in 1995 is "trunks; suit, camera, jewellery, cutlery cases; travel, tool, similar bags; wholly or mainly covered by leather, composition leather, plastic sheeting, textile materials, vulcanised fibre, paperboard" (HS4 code 4202).

textiles,[11] and toys to become a major exporter of electronics and machinery. Notably, China now directly competes with the United States in many of these product categories, as the U.S. share has declined while China's has surged. By 2023, China (including Hong Kong) accounted for 33 percent of global electronics exports, compared with around 4 percent each for the United States and Mexico.

Figure 10 displays the Mexico's largest exports by HS4 categories. Mexico's exports have been overwhelmingly dominated by automobiles and petroleum products, with little change over the last 30 years.

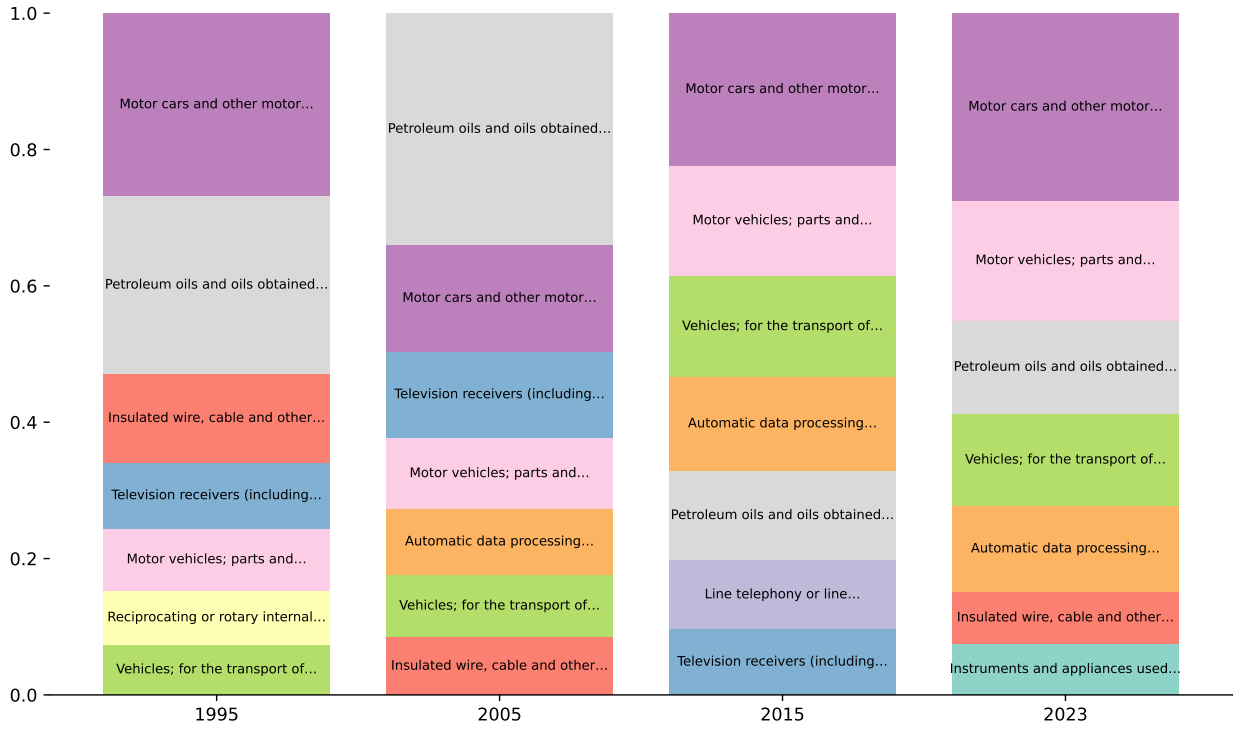
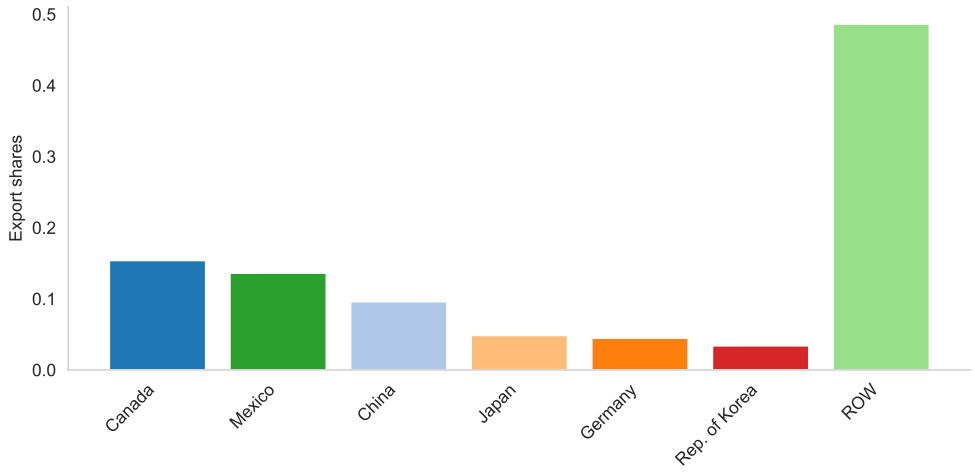


Figure 10: Mexico's largest exports by HS4 products

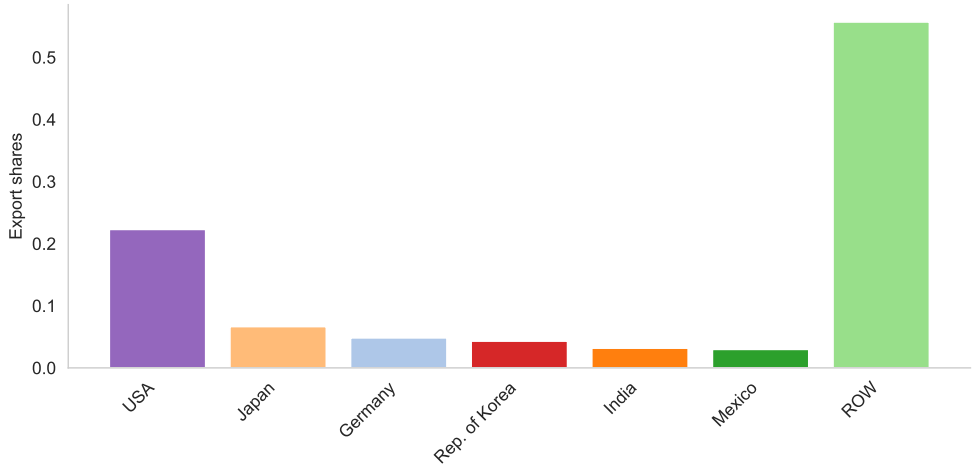
Source: CEPII BACI database.

The difference in export diversification can also be seen in export destinations. Figure 11 shows the top export destinations for each of the three countries in 2017. The United States is the largest export destination for both China and Mexico, accounting for around 20 percent of China's exports and 70 percent of Mexico's exports. Both the United States and China have more diversified export compositions than Mexico. We hypothesize that the reliance of Mexico's exports on the U.S. market and its position in the North American

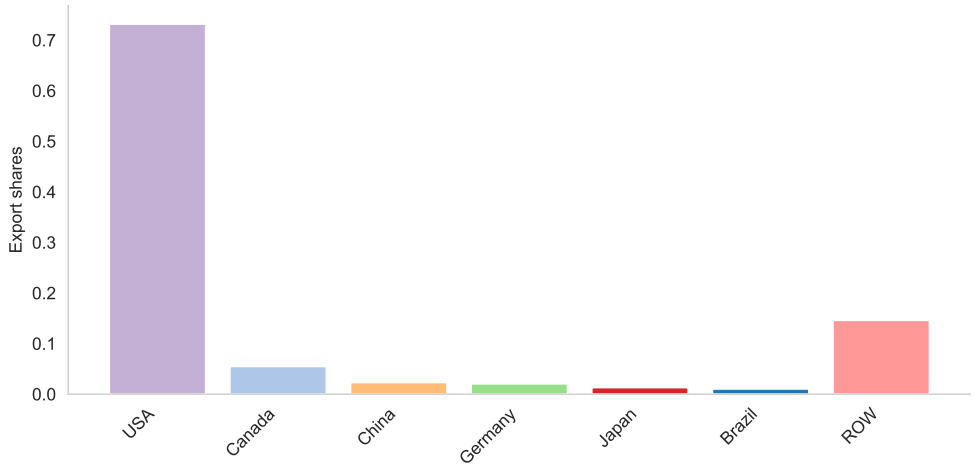
[11]The names for the two footwear categories in 1995, are "footwear; with outer soles of rubber, plastics, leather or composition leather and uppers of leather" (6203) and "footwear; with outer soles and uppers of rubber or plastics (excluding waterproof footwear)" (6202).



(a) United States



(b) China



(c) Mexico

Figure 11: Export shares by country, 2017

Source: CEPII BACI database. We exclude exports of China's mainland to Hong Kong.

value chain have constrained its growth. Similar results can be obtained using observations from other years.

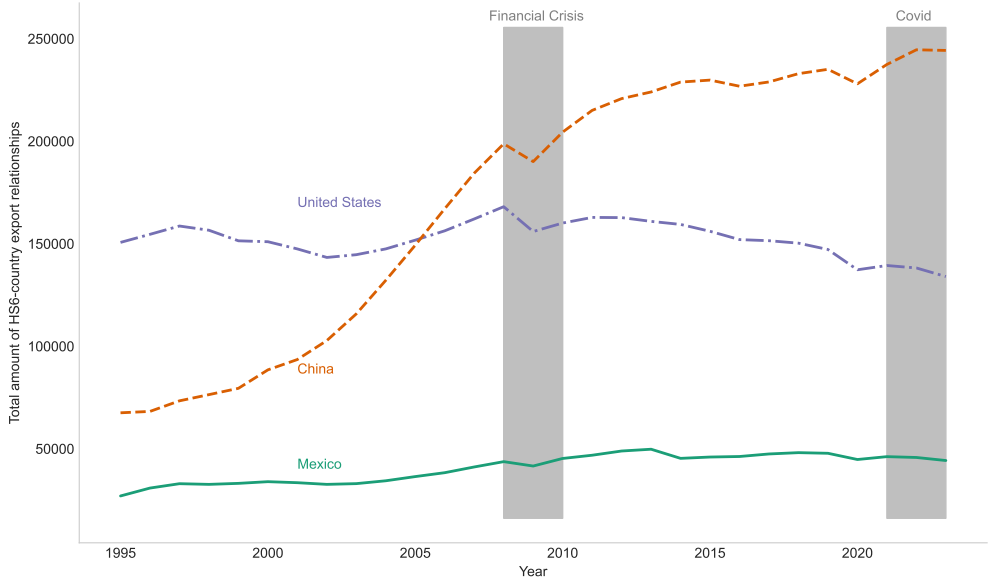


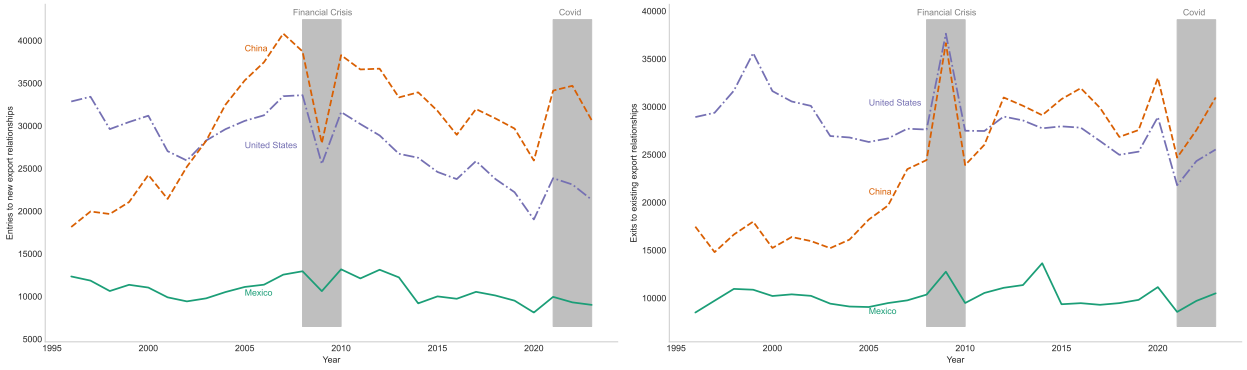
Figure 12: Total export relationships

Source: CEPII BACI database. Export relationships are defined as the country-HS6 product pairs with export values exceeding a certain threshold in a given year; the threshold is 1 million USD in 2023, adjusted for inflation and countries' relative export sizes.

The extensive margin of trade is vital to trade growth as Kehoe and Ruhl (2013) argued. We analyze the changes of the extensive margin of trade by looking at the establishment of export relationships. We define an export relationship as a country-HS6 product pair with export value exceeding a certain threshold in a given year. The threshold is set at 100,000 USD for the United States. For China and Mexico, is adjusted for inflation and relative export size, and we use 2007 as the base year. For concreteness, in 2023, the threshold is 129,000 USD for China, and 24,000 USD for Mexico. Figure 12 shows the total number of export relationships established by the three countries from 1995 to 2023. Both China and Mexico increased their number of export relationships. China's growth on the extensive margin is much more evident, particularly after 2001, when it joined the WTO.[12]

Figure 13 shows the number of entries and exits of the same export relationships each year. China's number of entries grew quickly after it joined the WTO, while Mexico's entries have been more stable. The steady decline and the rise of exits in establishing new

[12]The result is robust to using different nominal values for the threshold, or alternative base years. We also tried using the same threshold for all countries, and the result was that Mexico's export relationships were difficult to see.



(a) Entries (b) Exits

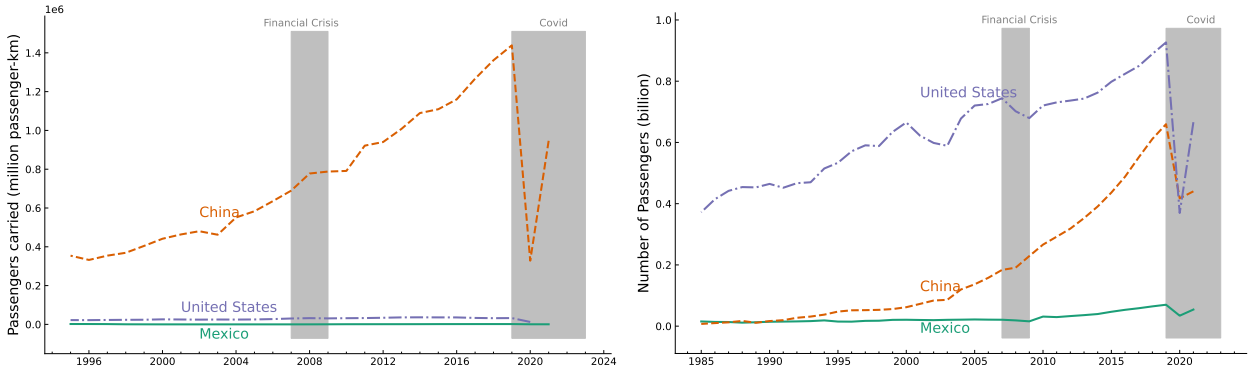
Figure 13: Export relationships: entries and exits

Source: CEPII BACI database. Export relationships are defined as the country-HS6 product pairs with export values exceeding a certain threshold; the threshold is 1 million USD in 2023, and is adjusted for inflation and countries' export sizes.

relationships in China after 2006 is consistent with the declining export to GDP ratio in Figure 2. China maintained a large number of export relationships after the financial crisis and exhibited more churning-that is, more entries and exits. This is consistent with the idea that China is still moving up the value chain, with firms entering into more profitable markets and exiting others. Mexico's entries and exits into export relationships have stayed relatively inactive. As a result, Mexico's larger export to GDP ratio cannot be attributed to entries into new export relationships; rather, it is due to the intensive margin increase of the exports of the same products to the same countries as indicated in Figures 10 and 11. For reference, the number of entries for U.S. exports declined after the Global Financial Crisis, while exits are more stable over the years. The reduction of churning in the United States is consistent with the findings in Hummels and Yue (2024), who argue that the business dynamism has been declining in the United States.

Infrastructure Investment

China invests a much larger share of its GDP in infrastructure. Data from the Public-Private Infrastructure Advisory Facility (PPIAF) of World Bank show that in 2021, China invested in 6.1 percent of its GDP in infrastructure, compared with only 1.5 percent for Mexico; the upper-middle-income country average was 3.6 percent. An alternative measure by Xiong and Song (2024), which combines China's local government data, estimates that the infrastructure investment to GDP ratio in China has remained above 10 percent since 1998.



(a) Distance traveled by railways

(b) Passengers by air

Figure 14: Comparison of passenger transportation

Source: OECD. The railway traveling distance is in million passenger-kilometers.

Historically, China and Mexico started with similarly low levels of infrastructure but have experienced sharply different trajectories of development. In recent years, China has conducted massive investments in high-speed railways, airports, and urban infrastructure, which have significantly improved the country's connectivity and productivity. In 2024, World Economic Forum ranked China 15th out of 67 countries in infrastructure globally, while Mexico ranked 62nd. China has developed the world's largest railway network (98,798 miles) and also tops the world in yearly passenger-kilometers traveled by rail. In contrast, Mexico's railway system is relatively underdeveloped, with only 16,723 miles of railways in total. In addition, 27,962 miles of railways in China are high-speed railways, of which there are almost none in Mexico. China has also become a major exporter of infrastructure goods and services, particularly through its Belt and Road Initiative (BRI). China has financed and constructed infrastructure projects in BRI countries, whose value is over 1 trillion USD.

Figure 14 compares passenger transportation by railways and air across the two countries, with the United States included as a reference point. Historically, China has relied more heavily on railways for passenger travel, and it has managed to triple its annual railway capacity over the past decades.[13] At the same time, China has rapidly expanded its air transport network, demonstrating a clear pattern of catching up with the United States. In contrast, Mexico's growth in both transportation modes has been much slower, and its overall capacity remains significantly smaller than that of both the United States and China, even after accounting for its smaller population. Similar patterns can be observed in freight transportation. A strong public transportation system enables efficient movement

[13] See Wang, Du, Liu, and Tong (2022) for an overview of China's railway system from 1999 to 2019.

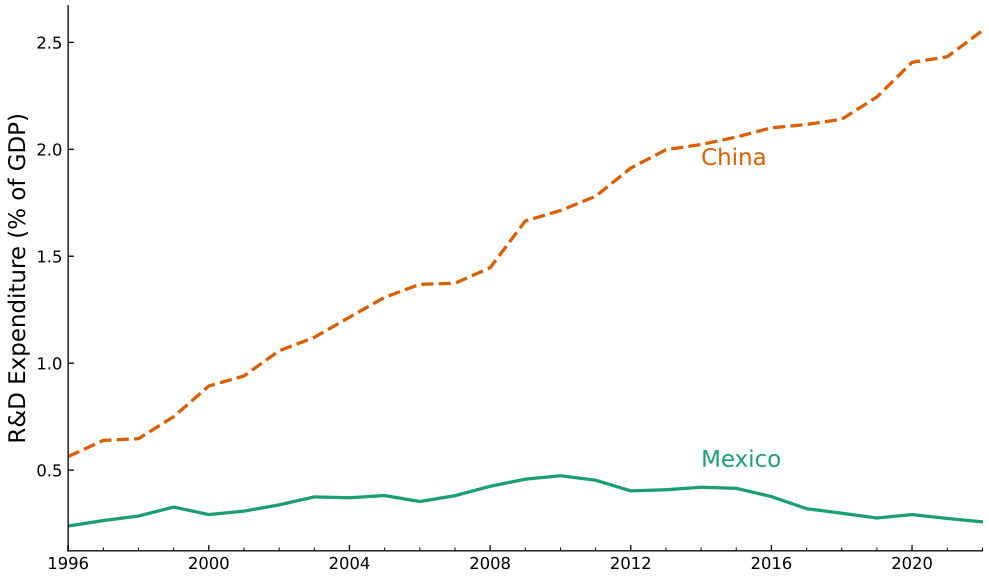


Figure 15: R&D expenditure, percent GDP

Source: UNESCO

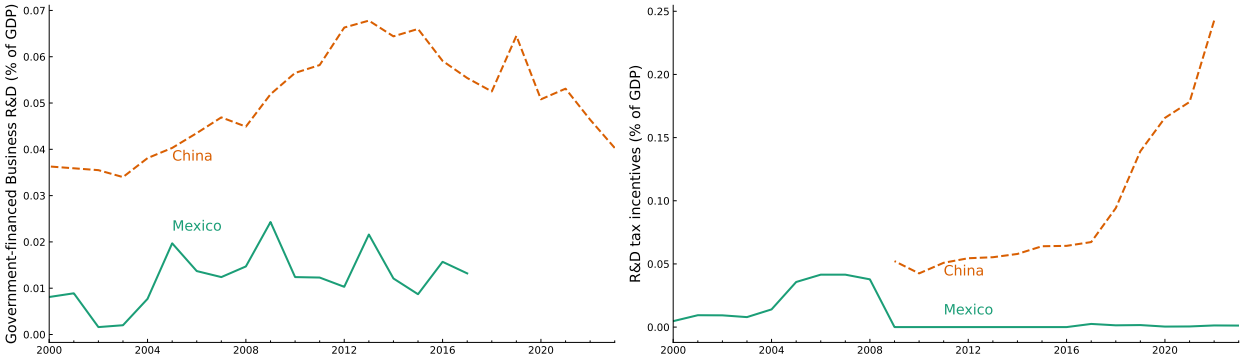
of goods and people, and is crucial for long-term growth.

R&D and Industrial Policy

Figure 15 plots R&D expenditure as a share of GDP for China and Mexico. The contrast is stark. China experienced a rapid increase in R&D expenditure from around 0.5 percent of GDP in 1996 to over 2.5 percent in 2021 (more than four times the OECD average), while Mexico's R&D expenditure remained below 0.5 percent of GDP throughout the same period. Given the much larger size of aggregate GDP, this suggests that China has been more proactive in supporting innovation and technology development, which is crucial for long-term growth.[14]

One explanation for the large gap in R&D expenditure is industrial policy. China has implemented a state-led industrial policy framework centered on successive five-year plans and strategic initiatives. It began with the Eleventh Five-Year Plan's emphasis on strategic emerging industries in 2006, continued with the 2015 Innovation-Driven Development Strategy (IDDS), and includes the flagship Made in China 2025 program. These policies systematically channel fiscal subsidies (entry, production, and investment subsidies totaling over $60 billion annually) and preferential tax incentives to sectors such

[14] Konig, Storesletten, Song, and Zilibotti (2022) argue that China's R&D investments are misallocated toward larger firms because of policies and financial frictions.



(a) Government financed business R&D

(b) R&D tax incentives

Figure 16: Public investment for business R&D, percent GDP

Source: OECD R&D tax expenditure data set

as semiconductors, robotics, biotechnology, electric vehicles, and aerospace. Although Mexico has also implemented industrial policies, they have been less comprehensive and more fragmented. The Mexican government has focused on attracting foreign direct investment and promoting export-oriented manufacturing, particularly in the automotive and electronics sectors. These policies have not translated into significant domestic R&D or innovation capabilities, however.

Figure 16 shows public investment in business R&D in China and Mexico. China has been investing a much larger share of its GDP in business R&D.[15] The Chinese government has implemented a comprehensive set of policies to support R&D, such as the National Medium- and Long-Term Program for Science and Technology Development (2006–2020) plan, which targets both basic and applied research. In addition, China has dramatically increased its indirect government support through R&D tax incentives, providing more than 0.25 percent of its GDP in recent years, while such support in Mexico has been below 0.1 percent of its GDP.

Patent applications are considered a good proxy for firm innovation (Hausman, Hall, and Griliches, 1984). Figure 17 shows the number of patent applications for the United States, China, and Mexico. Patent applications of Chinese firms have been consistently increasing, and they surpassed U.S. firms' applications around 2010. Mexico's patent applications have changed little across the years, owing to factors such as a lack of innovation incentives for domestic firms and weak enforcement of IP protection. The same

[15] Chen, Liu, Suarez Serrato, and Xu (2021) argue that some Chinese firms relabeled expenses and over-reported R&D because of the R&D tax incentives. They argue that relabeling accounts for 24.2 percent of reported R&D in China.

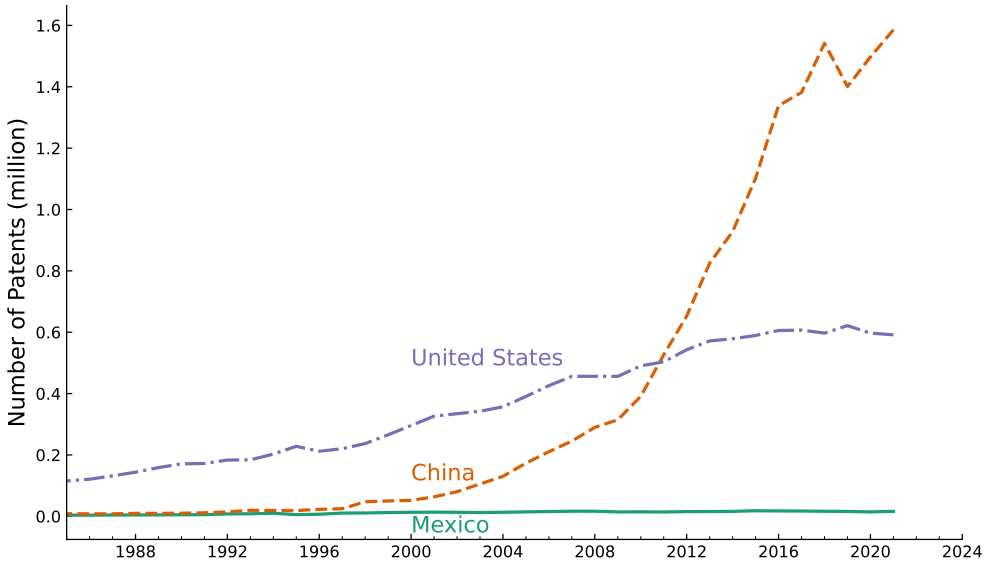


Figure 17: Total number of patent applications

Source: World Intellectual Property Organization (WIPO)

pattern holds if we restrict to patent applications for residents only.[16] The low number of patent applications in Mexico can be attributed to the shortage of researchers and research infrastructure. According to UNESCO, the number of researchers per million people in Mexico is only 273, while China has 1,686. As a comparison, the United States has 4,825 researchers per million people. Both China and Mexico still have catch-up to do in terms of research capacity.

Revisiting the Three Barriers to Riches in Kehoe and Ruhl (2010)

Kehoe and Ruhl (2010) argue that three barriers to riches have kept Mexico from benefiting from more openness after 1982: inefficient financial system, lack of rule of law, and rigidities in the labor market. They also argue China's growth would likely slow down because of the same factors. We revisit the three conjectures and argue that the limitations are still relevant and that without continued reforms, future growth may be constrained.

Inefficient Financial System: Figure 18 shows domestic credit to the private sector as a percent of GDP. Mexico's financial system exhibited remarkable stability during the global financial crisis, due mostly to the efforts of Agustín Carstens, who was the governor of

[16] He (2021) argues that a lot of patent applications in China are driven by other motives, such as seeking government subsidy or job promotion, reputation-building for individuals or universities and institutions, or acquiring certification as national high-tech enterprises.

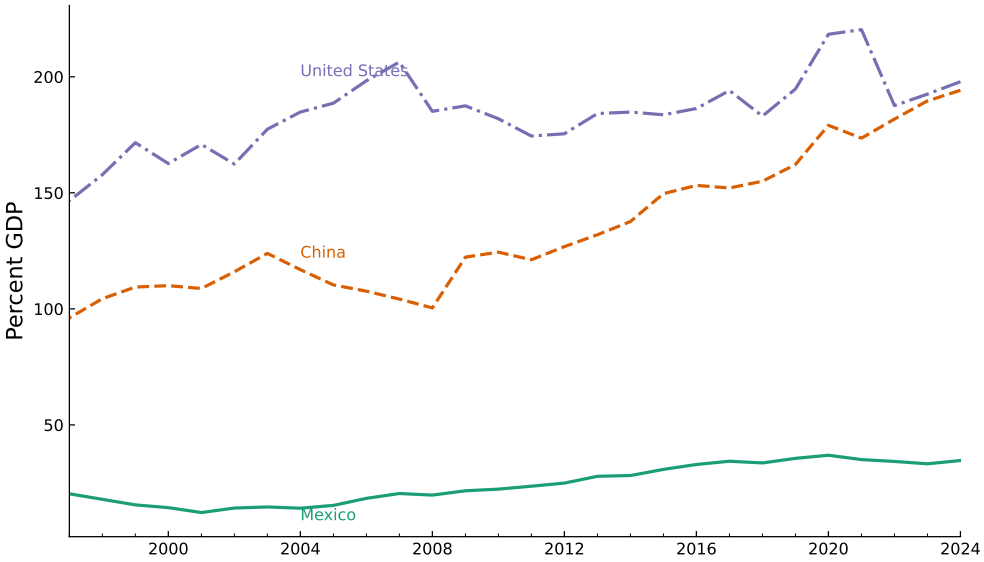


Figure 18: Domestic credit to private sector, percent GDP

Source: World Bank.

the Banco de México from 2010 to 2017. As Figure 18 shows, however, although Mexico has expanded domestic credit, its financial system still falls short of China's. China has greatly reformed and liberalized its financial system since 1990, when the Shanghai and Shenzhen Stock Exchanges were established, and its private credit provision has been catching up with that of the United States, while Mexico's has remained stagnant. This expansion appears to have come at the cost of financial stability, however. China had a large housing bubble (Jiang, Miao, and Zhang, 2022) and is still facing the aftermath of a mortgage crisis following the collapse of Evergrande, in 2021 (about 310 billion USD was owed by Evergrande alone). The financial system remains closed and dominated by state-owned banks. Moreover, SOEs and publicly traded firms still have preferred access to the credit market, as in Song, Storesletten, and Zilibotti (2011).

Lack of Rule of Law: Problems with the lack of rule of law in Mexico have become more acute since 2006. Figure 19 plots the homicide rate per 100,000 people. Mexico's homicide rate averaged 17.8 per 100,000 people from 2000 to 2020, while China averaged only 1.3. For comparison, the U.S. homicide rate averaged around 6. In Mexico, President Felipe Calderón declared war on drug cartels and organized crime in December 2006, which led to a surge in the homicide rate. In December 2018, President Andrés Manuel López Obrador adopted a policy of making peace with the drug cartels, adopting the slogan "abrazos, no balazos" (hugs, not bullets). This policy, however, resulted in the cartels seizing control of vast areas of the country and pushed the homicide rate even

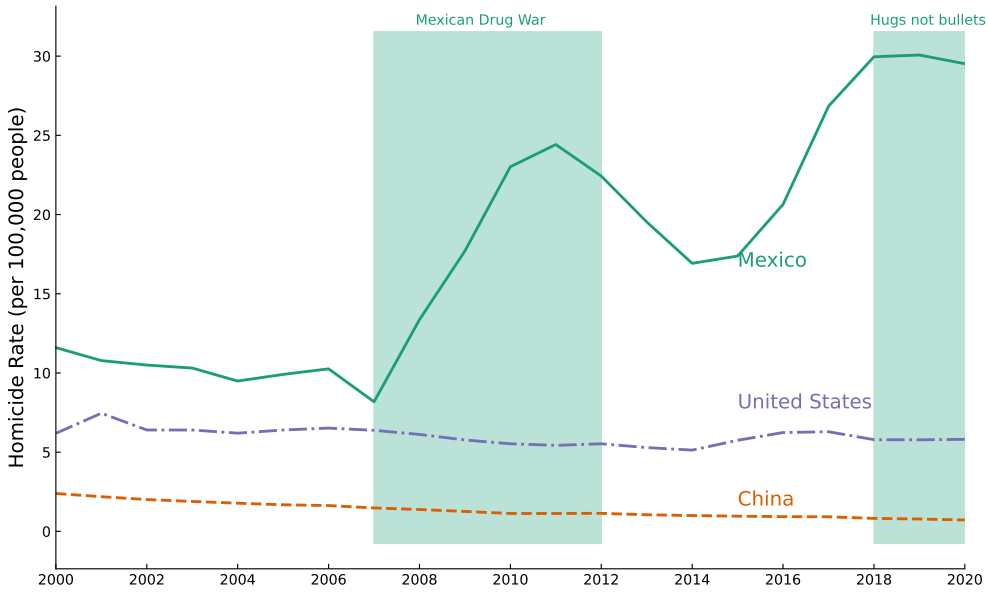


Figure 19: Homicide rate per 100,000 people

Source: WHO.

higher. It is still too early to tell what will happen under the administration of President Claudia Sheinbaum, who was inaugurated in December 2024.

China has been undergoing significant legal reforms, particularly since 2014, with the goal of strengthening the judiciary and promoting "Yifa zhiguo" (rule by law). These reforms include centralizing court finances, establishing circuit courts to reduce local influence, and digitizing court processes. Nevertheless, the Chinese government still exhibits strong influence in the judicial process, and further reforms on judicial independence are necessary.

In addition to more stringent crime regulations, China has also been strengthening its intellectual property (IP) protection regime and promoting patent activity as part of its innovation-driven development strategy. The Chinese government has enacted comprehensive amendments to its patent law (notably in 2008 and 2020) to enhance enforcement, increase penalties for infringement, and align with international standards such as the TRIPS Agreement. Specialized IP courts have been established in major cities to improve judicial protection and efficiency. Although enforcement challenges and local protectionism persist, these efforts have contributed to the dramatic rise in patent applications seen in Figure 17. Similar efforts have been made in Mexico, but the results have been less impressive. According to the International Property Rights Index,[17] in 2024,

[17] See International Property Rights Index

Mexico ranked 77 out of 125 countries, while China ranked 51. Both countries still face challenges in enforcing IP rights.

Rigidities in the Labor Market: Mexico continues to have a rigid formal labor market and a sharp distinction between the formal and the informal labor markets. China has undergone significant reforms in its labor market, but the Chinese household registration system (*Hukou*) and regionally biased college enrollments continue to create frictions. In particular, the *Hukou* system classifies households as being rural or urban, and was designed to restrict labor inflows from rural areas to cities. It imposes restrictions on rural households in cities, such as limits on public-sector employment, acquiring housing and vehicles, and accessing education. Wang and Conesa (2022) argue that such systems actually helped China's earlier growth by forcing workers to migrate from rural areas to cities into the more efficient private sector. Many of these restrictions have been lifted over the past decade.

Conclusion

In this article, we revisit the question posed by Kehoe and Ruhl (2010): Why has Mexico's trade openness not translated into sustained growth, whereas China's has? We show that openness by itself was not the decisive force; its timing and the broader structural and institutional context mattered. China's liberalization occurred while it was still undergoing rapid structural transformation–shifting labor out of agriculture and building industrial capacity–which created a powerful growth tailwind. Mexico, by contrast, opened after its earlier phase of structural transformation had largely played out, and thus lacked the same momentum.

Beyond the fortuitous timing of its opening, China combined openness with moving up the value chain, investing in infrastructure, supporting domestic R&D, and overcoming barriers to growth. Mexico's experience was constrained by its narrower and less dynamic export relationships, inadequate domestic investments in infrastructure and innovation, lack of rule of law, and rigidities in the labor market.

Another imminent concern for many countries, and especially for China, is the challenge posed by aging demographics driven by a falling fertility rate. Figure 20 plots the fertility rate (births per woman) for China and Mexico, alongside the United States and Japan for comparison. In 2023, China had the fertility rate at just 1.0–among the lowest in the world. The median age in China was 39.6 in 2024, and is projected to continue rising. Since China's public pension system operates largely on a pay-as-you-go basis, the

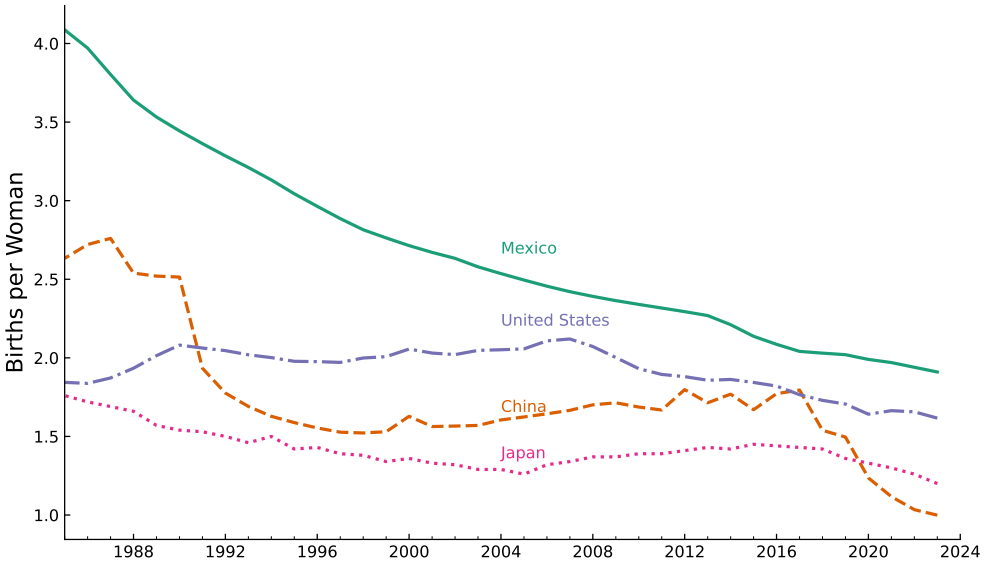


Figure 20: Fertility rate

Source: UN Population Division

combination of a shrinking labor force and increasing life expectancy is projected to place substantial fiscal strain on the government in the future. The experience of Japan provides a clear warning: a fertility rate below replacement since the mid-1970s has led to rapid aging, a median age above 49, and prolonged economic stagnation despite technological progress. According to Figure 20, China is on a similar path and moving even more rapidly.

In the future, we project that China will continue to grow because of the ongoing structural transformation. The growth rate will slow down, however, as the country approaches the technological frontier and the demographic dividend fades. Mexico, on the other hand, needs to address its structural issues to achieve sustained growth. The country should focus on improving its institutions, investing in infrastructure, and promoting innovation to move up the value chain and achieve long-term growth.

Perhaps, the most fruitful topic for future research suggested by the article is how government policy can incentivize firms to move up the value chain in terms of production and exports. Further research is also needed to determine the optimal levels of government investment in infrastructure and in R&D. It is possible that China has overinvested in these areas. Such overinvestment could have resulted in a higher growth rate, but also in a lower level of private consumption and household welfare.

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