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GLOBALIZATION, TECHNOLOGY, INFORMALITY, AND ITS EFFECTS ON THE WAGE STRUCTURE IN MEXICO

CARLOS ARTURO CHARLESTON DOMÍNGUEZ

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ASESOR:

RAYMUNDO MIGUEL CAMPOS VÁZQUEZ

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RESUMEN

Los retornos a las habilidades o la estructura salarial en México ha cambiado sustancialmente en los últimos años. Esta tesis contribuye a la literatura previa analizando un mecanismo que afecta la estructura salarial que es la globalización. Se analizan las consecuencias de la globalización sobre el mercado laboral en México para trabajadores con distintos niveles de habilidades y con distinto régimen de seguridad social (formales/informales). En particular, se analiza el efecto del aumento de la competencia China en los mercados estadounidenses y la exposición al comercio internacional, medida como exportaciones por número de trabajadores, de las Zonas Metropolitanas de México. Utilizando la exposición inicial a la globalización de las Zonas Metropolitanas de México, se construyen dos variables instrumentales que permiten identificar los efectos de ambas medidas de globalización. Se encuentra que una mayor exposición a la competencia China afecta los salarios de los trabajadores informales poco calificados y afecta negativamente el empleo para todos los trabajadores, excepto para los trabajadores formales poco calificados. Sin embargo, no hay un efecto significativo del aumento de las exportaciones mexicanas sobre los salarios. Se utiliza la clasificación de ocupaciones como una medida alternativa de habilidades y los resultados son robustos a esta especificación alternativa. El resultado principal es que los salarios de los trabajadores informales poco calificados se vieron afectados por la competencia de las importaciones chinas en los mercados estadounidenses, mientras que los salarios de los trabajadores formales y altamente calificados no. Los resultados proporcionan un canal plausible para explicar la variación en la estructura salarial de México entre 2005 y 2018.

Palabras Clave: Comercio internacional, mercado laboral, Salarios, Habilidades, Estructura salarial, Competencia importada, Informalidad, México

ABSTRACT

The returns to skills or wage structure in Mexico has changed substantially in recent years. This research contributes by analyzing one mechanism that can affect the wage structure that is globalization. This paper analyzes the consequences of globalization on Mexico's local labor market for different types of workers. In particular, the effect of increased Chinese competition in U.S. markets and increased exports from Mexico. Using the differentiated initial exposure of Mexico's metropolitan zones to globalization, two Bartik-type instrumental variables are constructed to identify the effects of both measures of globalization. This research finds that increased exposure to Chinese competition hurts low-skilled informal workers' wages and negatively affects employment for all types of workers except low-skill formal workers. However, there is no significant effect of the increase in Mexican exports on wages. Occupations are used as an alternative measure of skills, and the results are robust to this alternative specification. The key finding is that low-skilled informal workers wages were affected by competition from Chinese imports in U.S. markets, while highly-skilled and formal workers wages were not. The results provide a plausible channel to explain the Mexican wage structure variation from 2005 to 2018.

Keywords: Trade, Labor Markets, Wages, Skills, Wage Structure, Import competition, Informality, Mexico

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1 Introduction

Since the late 80s, the returns to skills and thus wage inequality in Mexico has followed different trends [1], it first rose between 1988 and 1994 and declined between 1994-2006 (Esquivel & Rodríguez-López, 2003; Lustig, Esquivel, & Campos-Vázquez, 2012; Campos-Vázquez, 2013b). During 2006-2020 the trend is far from clear. Different surveys give different results about wage inequality, so there is no clear pattern about the skill premium and wage inequality during this period. [2] [3]

The period in which it rose coincides with a period in which Mexico experienced a large opening of its economy when it joined the General Agreement on Tariffs and Trade (GATT). The Stolper-Samuelson theorem would predict that trade liberalization should close the wage gap between skilled and unskilled labor as Mexico was an unskilled labor abundant country. However, this is clearly at odds with the data. Following trade liberalization, wage inequality increased considerably instead of decreasing.

For the period in which wage inequality declined, the North American Free Trade Agreement (NAFTA) came into effect and consolidated Mexico's openness to trade. During this period, according to Campos-Vázquez (2013b), there were substantial increases in high school and college enrollment that generated an increase in the supply of college-educated labor force that was not matched with an increase in the demand for skills that reduced the returns to skills and decreased wage inequality. Why does the demand for skills did not increase as the supply of college-educated labor force? One explanation, according to Robertson (2007) is that after NAFTA, Mexico experienced an intensification of integration with the United States that benefited the relative low-skill sectors as with NAFTA, Mexico's manufacturing workers became complements of production rather than substitutes for the United States, which is Mexico's leading trading partner.[4]

The relative returns or the wage structure are affected by the demand and supply of workers with different skill levels and institutional factors. To understand what happened with returns to skills in 2006-2020 is essential to study what happened with channels that can shape the demand for skills. In this work, one mechanism is analyzed, which is globalization. This mechanism can explain what happened with the demand for skills and thus some variation on Mexico's wage structure during 2006-2020. [5] Globalization can also shift the demand for skills indirectly by its effect on the informal sector Aleman-Castilla (2006) or its effect on skill upgrading (Verhoogen, 2008; Bustos, 2011b). It is difficult to talk about a channel that shapes the demand as the demand is not observed. We observe the equilibrium points in which demand for different types of workers is equal to the supply, that is, the wage. Globalization affects wages in classical trade models through changes in the demand for workers with different skill levels. Nevertheless, trade can also affect supply. There is evidence that trade can reduce the acquisition of education Atkin (2016) and that can increase labor force participation Rodriguez-Castelan, Vazquez, and Winkler (2020). Nevertheless, the main effect of the globalization mechanism on wages is through demand.

[1] In Mexico, there is research showing that changes in wage inequality can be largely linked to changes in the relative returns between skilled and unskilled workers, that is, returns to skills.

[2] For a detailed explanation on the survey correction, refer to (Campos-Vázquez, 2013a; Campos-Vazquez & Lustig, 2017). The main result is that after 2006 with the corrected survey, inequality stopped its downward trend.

[3] Using the Encuesta Nacional de Ocupación y Empleo (ENOE), there is a sharp decline in skill premium during this period. In fact, according to Levy and Lopez-Calva (2016), by 2015, earnings for the group with a college education were 7 percent below the 1996 level.

[4] By 2019, Mexican exports to the United States represented 76% of Mexico's total exports. By 2020, Mexico became for the first time the United States' top trade partner passing both China and Canada, previous top trade partners.

[5] For a complete review of the potential explanations of the decline in the returns to education (observable skills) in Mexico and Latin America, refer to Lustig, Lopez-Calva, Ortiz-Juarez, and Monga (2013).

In this research, globalization's effects are estimated by estimating the effect of Chinese import competition and increasing export opportunities on Mexico's local labor markets. Changes in labor-market outcomes from 2005 to 2018 across Mexico's Metropolitan Zones are related to changes in exposure to foreign markets and Chinese import competition on U.S. markets.

The problem of estimating these effects is that Ordinary Least Squares (OLS) estimates may be biased due to simultaneity bias. A Bartik-type instrumental variable is used to isolate globalization's effect on local labor-market outcomes from 2005 to 2018. The instrument used for the Mexican exports will be based on the pattern of demand from developed countries for exports of developing countries excluding Mexico. [6] Hence, metropolitan zones level changes in the instrument are driven by exports from other developing countries to developed countries and not by local factors. The instrument used for the import competition on U.S markets follows from Autor, Dorn, and Hanson (2013) and Chiquiar, Covarrubias, and Salcedo (2017) which use exports from China to eight developed countries except for the U.S. to instrument the increasing exports from China to the U.S.

Changes in the exposure measures are related to changes in metropolitan zone wages and employment levels that vary by skill level and formality. The first approach to measure skills is using education. A college education is used to measure high-skilled workers and less than college as an unskilled worker. Nevertheless, using education as a measure of skills represents some problems. As noted by Campos-Vázquez (2013b), there were substantial increases in college enrollment rates after 1994, which translated into an increase in the proportion of workers with a college degree. This substantial increase in college enrollment rates can bias the results as the population share with a college degree increased sharply. To overcome this concern, this research use occupations as another measure of skills. The results are robust to both measures of skills.

This research question is relevant mainly for three reasons: first, more equal societies are desirable but not necessarily if this comes due to lack of creation of good jobs for college-educated people instead of an increase in the wages of the lower tail of the wage distribution. Second, as there is a problem of increasing item non-response for labor income in the Mexican employment survey, the available information is inconclusive about what is happening with wage inequality, so a demand-based analysis can give us an insight due to its effects on the returns to skills which is an essential determinant of changes in wage inequality in Mexico. Lastly, globalization's effect on wages in Mexico is not so evident as the Stolper-Samuelson theorem's main result did not hold with Mexico's trade liberalization.

The main improvement of this research upon previous literature on the effects of globalization on labor market outcomes is that, to my knowledge, this is the first research that identifies the consequences of Chinese competition in the U.S. market on labor market outcomes of informal workers in Mexico. In particular, it differs from Chiquiar et al. (2017) by analyzing globalization effects on informal workers and using occupations as an alternative measure of skills. Chiquiar et al. (2017) finds an adverse effect of the increase in U.S. imports from China that compete with Mexican exports to the U.S. on wages for non-manufacturing workers. Simultaneously, the results of this research suggest that it harmed the wages of low-skilled informal workers. Another contribution of this work is to shed light on the returns to skills and thus wage inequality in a period with no apparent pattern and without enough research done by analyzing how globalization could shape the demand for skills and thus the wage structure. [7]

[6] Developed countries will be defined as High-income countries and developing countries as Upper-middle income according to the data from the World Bank.

[7] A notable exception is Campos-Vazquez and Lustig (2017).

This work is organized as follows: Section 2 makes a review of previous research. Section 3 briefly describe the databases used, their main weaknesses, and how to overcome their weaknesses. Section 4 presents a descriptive analysis. Section 5 explains the exposure measures used. Section 6 summarizes the methodology used to identify the exposure measures' effects. Section 7 present the results. Section 8 made a brief discussion of the results and concludes.

2 Related Literature

Much research has been done to explain the trends of wage inequality in Mexico. The explanations can be divided into two groups: local market forces explanations and trade induced explanations. The leading explanation for the local market forces explanations is that the main driver of wage inequality changes is the change in returns due to demand and supply of labor by skill levels. (Lustig et al., 2012; Campos-Vázquez, 2013b; Campos-Vazquez & Lustig, 2017; Lustig et al., 2013) Institutional factors (minimum wages and unionization rate) affected inequality during the period of increasing inequality Bosch and Manacorda (2010). However, as these variables remained mostly constant after 1994, they cannot explain the decline of wage inequality in Mexico.

However, the causes behind the changes in returns have not been unambiguously established. The trend of wage inequality in Mexico can be divided into three periods. A period of rising inequality (1989-1994), a period of declining inequality (1994-2006), and a period with a not so clear pattern (2006-2017).[8] [9]

The period in which it rose coincides with a period in which Mexico experienced a large opening of its economy when it joined the General Agreement on Tariffs and Trade (GATT). The Stolper-Samuelson theorem predicts that trade liberalization would close the wage gap between skilled and unskilled labor as Mexico is abundant in unskilled labor. The data shows an apparent contradiction with the classical trade theory predictions, and much research was done to understand this contradicting evidence[10] and some found evidence supporting the Stolper-Samuelson theorem as Chiquiar (2008) which found evidence for the regions that exhibit stronger links with the U.S. market than regions that do not exhibit such integration with the U.S.

Other authors such as Esquivel and Rodríguez-López (2003) argue that there is strong support to the Stolper-Samuelson theorem. However, returns to skills rose during the pre-NAFTA period due to a skill-biased technological change that increased the demand for skilled labor in Mexico and overcame the trade liberalization effect on wages. Cragg and Epelbaum (1996) Also found evidence of a skill-biased technological change in the pre-NAFTA period as the export-oriented sector became more skill-intensive. In contrast, Robertson (2004) argue that with the GATT, Mexico liberalized trade with less-skill abundant countries, and before GATT, Mexico protected more the less-skill intensive industries. Following entrance to the GATT, the relative price of skill-intensive goods rose, and, consistent with the Stolper–Samuelson theorem's predictions, the relative wage of skilled workers rose. Attanasio, Goldberg, and Pavcnik (2004) finds that trade liberalization in Colombia also resulted in increased wage inequality but a lower magnitude than in Mexico. There is extensive evidence that the trade liberalization process in developing countries resulted in higher wage inequality. Nevertheless, the reasons have not been unambiguously established.

[8] Different surveys produce entirely different results about inequality in this period, so there is no clear pattern about the skill premium during this period. For a detailed explanation of the survey correction, refer to Campos-Vazquez and Lustig (2017). After 2006 with the corrected survey, the main result is that inequality stopped its downward trend.

[9] Using the Encuesta Nacional de Ocupación y Empleo (ENOE) there is a sharp decline in skill premium during this period. In fact, according to Levy and Lopez-Calva (2016), by 2015, earnings for the group with a college education were 7 percent below the 1996 level.

[10] A complete literature review can be found in (Esquivel, 2011; Esquivel & Rodríguez-López, 2003)

Gordon Hanson and Harrison (1999) and Feliciano (2001) Also finds evidence supporting classical trade theory. They find that Mexico protected less skill-intensive industries before GATT, and tariff reductions were larger for less skill-intensive industries. When Mexico joined the GATT, the relative price of skill-intensive goods increased, and so the relative wage of skilled labor. Revenga (1997) finds that trade liberalization caused a decline in wages of 10-14 percent in the most protected industries.

On the other hand, the period of declining inequality has been much less studied. One explanation based on supply factors is presented by Campos-Vázquez (2013b). The author suggests that during the period in which the skill premium declined (1994-2006), the North American Free Trade Agreement (NAFTA) came into effect and consolidate Mexico's openness to trade. Nevertheless, substantial increases in high school and college enrollment in this period generated an increase in the supply of college-educated labor force that was not matched by an increase in the demand for skills that reduce the skill premium. [11] This is at odds with developed countries experience in which the increase in the supply of skilled labor force was accompanied by an increase in the demand for skilled labor (Acemoglu, 1998, 2003; Katz & Murphy, 1992; Katz & Autor, 1999; Bound & Johnson, 1992).

Robertson (2007) provides a trade-based explanation for the wage premium decline period. It suggests that Mexico's manufacturing workers went from being substitutes for U.S. production workers in the GATT period to being complements in the NAFTA period, inducing an increase in the demand for unskilled labor and reducing wage inequality. Esquivel (2011) argues that the equalizing effect of labor income since NAFTA can be explained as the combination of a late outcome of trade liberalization (as in standard trade theory) and a change in Mexico's workforce composition in terms of education and experience. [12]

The last period (2006-2017) has not been widely studied. Campos-Vazquez and Lustig (2017) address the problem of inconsistency in the trend of income inequality between the Mexican labor force survey (ENOE, by its Spanish acronym) and the Household Income Expenditure National Survey (ENIGH, by its Spanish acronym). In ENOE, labor income inequality continued its steady decline while ENIGH shows a slight increase. The authors address this inconsistency by correcting high and rising labor income non-response and under-representation of high-wage earners. With the corrected data, they found that inequality no longer declines in this period.

Trade can affect labor markets through different channels other than those of classical trade theory. One of these channels is by trade in intermediate inputs/task. (Feenstra & Hanson, 1996, 1997) develop and test a model that links Foreign Direct Investment (FDI) with changes in relative wages, arguing that U.S. multinationals firms outsource activities that are low-skilled for the U.S. but high-skilled for Mexico, raising skills premium in both countries. In contrast with these results, Airola (2008) using the Mexican Household Income and Expenditure Survey (ENIGH) instead of manufacturing data, and finds little evidence that growth in FDI and maquiladora employment is positively related to the increase in relative wages of more educated workers.

Another possible channel in which trade liberalization can affect local labor markets is quality or technology upgrading. Verhoogen (2008) proposes this mechanism linking trade and wage inequality. More productive firms produce higher quality goods to export and pay higher wages to maintain a higher quality workforce. The more productive plants increase exports, upgrade quality, and raise wages relative to less productive firms in the same industry,

[11] Atkin (2016) presents empirical evidence that the growth of export manufacturing in Mexico altered the distribution of skills in Mexico. He finds that for every twenty-five jobs created, one student dropped out of school at grade nine rather than continuing through grade twelve. This is driven by less-skilled export-manufacturing jobs that raised the opportunity cost of skill acquisition.

[12] For a detailed literature review of the distributional effects of globalization in developing countries during the 1980s and 1990s, refer to Goldberg and Pavcnik (2007).

increasing within-industry wage inequality. He finds evidence of this mechanism in Mexico's manufacturing sector. (Bustos, 2011b, 2011a) presents evidence of skill upgrading within firms increasing the demand for skills due to a regional trade agreement (MERCOSUR) in Argentina.

Another channel through which the demand for skills can be affected is the informal sector. In Mexico, according to Levy and Lopez-Calva (2016), 90.3 percent of all firms in 2008 were informal, and 90 percent of all firms were small (up to five workers). [13] Also, informal firms have lower productivity than formal firms systematically. They co-exist in the same sectors; hence the hypothesis that firms in each sector produce very different goods is not valid for Mexico. [14] Lastly, during 1998-2013 the number of formal firms falls by 12 percent while the number of informal firms rose by 66 percent. Moreover, informal firms' employment increased by 125.4 percent and just 10.6 percent on formal ones during this period.

Taking this into account and the fact that formal firms are more skill-intensive than informal firms Levy and Lopez-Calva (2016) brings a new explanation for the decline in the skill premium during 1996-2015. According to them, distortions misallocate too many resources toward informal firms that are less skill-intensive than formal firms that reduce the demand for skills and thus the skill premium. [15]

Most of the studies that link trade with labor markets ignore the critical characteristic of developing economies that are the informal sector. Two exceptions are (Dix-Carneiro, Goldberg, Meghir, & Ulyssea, 2019; Becker, 2018). The former developed and estimated a model using data sources from Brazil, and they find that domestic policies leading to a reduction in informality have a larger effect on welfare relative to policies aiming to reduce international trade costs and that reductions in trade costs have substantial effects reducing informality within the tradable sector. However, these reductions lead to an increase in informality within the non-tradable sector. The latter finds that trade liberalization leads to a decrease in informal sector employment. However, total employment and welfare can either increase or decrease depending on the characteristics of the economy. It also finds that opening the economy to trade increases the formal sector average wage faster than the informal sector average wage.

Goldberg and Pavcnik (2003) investigates the relationship between trade policy and the informal sector, and the authors do not find significant evidence that trade reforms increase informal employment in Brazil and Colombia, suggesting that trade policy is of secondary importance in determining the incidence of informal employment. One work that links trade liberalization with informality in Mexico is Aleman-Castilla (2006). The author develops a Melitz (2003) type model that implements the informal sector, and he finds evidence supporting the conclusion of his model that reductions in the Mexican import tariffs are significant in reducing the likelihood of informality in the tradable sectors. Also, the author presents evidence of a widening effect of trade liberalization on the formal-informal wage gap.

Corona-Orraca (2018) build a model in which two opposing forces take place: competitive advantages [16] and comparative advantages; competitive advantage work in favor of skilled workers while the comparative advantage in favor of unskilled workers as Mexico is a country abundant in unskilled labor. These two effects explain the first

[13] Informal firms have, on average, 2.8 workers but account for 57.3 percent of all employees even though the informal sector represents 90.3 percent of all firms, meaning that in Mexico exist many small informal firms.

[14] The overlap between firms in the same sector has been increasing. In 1998 informal firms were the majority of firms in 34 percent of the 278 six-digit sectors in manufacturing, in 62 percent of the 142 six-digit sectors commerce, and 66 percent of the 252 six-digit sectors in services. In 2013 these percentages increased to 51, 81, 88, respectively.

[15] Misallocation lowers the average earnings of all informal workers but with substantial differences across educational levels affecting more those with a college education.

[16] Competitive advantage comes from resources being reallocated to the most productive firms within industries, which are also the most skill-intensive industries.

increase in wage premium as the competitive advantage effect dominated and the latter decline as the comparative advantage effect dominate.

The most closely related works are Rodriguez-Castelan et al. (2020) and Chiquiar et al. (2017) that uses Bartik-type instruments to identify the effect of trade on different variables for Mexico. The former uses an instrument of this type for Mexico's municipalities and finds that an increase in the ratio of exports to workers reduces income inequality measured by the Gini coefficient. However, they do not find significant effects on poverty reduction nor average income. They argue that the lack of effect on average income is driven by a rise in labor supply at the local level because municipalities with higher export growth experienced an increase in labor force participation and attracted more internal migration, particularly of unskilled workers. The latter analyzes the labor market consequences of international trade using the evidence provided by the behavior of Mexican labor markets after the introduction of NAFTA in the nineties and the accession of China to the World Trade Organization (WTO) in 2001 using the local market variation on exposure to international markets to identify the effects of these events. They find that NAFTA integration reduced unemployment and boosted employment and wages, while Chinese competition tended to have the opposite effect. Additionally, they find that the labor market responses to international trade are heterogeneous across regions in the country, significantly more substantial in the regions closer to the U.S. border.

As we can see from the evidence presented before, there are different and not necessarily mutually exclusive explanations for the non-monotonic trend of labor income inequality in Mexico. No single channel can explain this trend, so it is needed to understand how these different mechanisms interact and how they affect Mexico's demand for skills and thus wage inequality.

3 Data

The primary data sources are the *National Survey of Occupation and Employment* (ENOE, by its Spanish acronym) and the Economic Census, which are related with measures of globalization using information about exports from the BACI International Trade Database Gaulier and Zignago (2010). This research use information from Mexico's official labor force survey (ENOE) from the first quarter of 2005 until the first quarter of 2020 and from the Economic Census of 2004. [17] Mexico's Labor Force Survey is a nationally representative quarterly survey that has information on types of employment (public or private employees, or self-employed); labor status (formal, informal or unemployed); location (municipality and auto represented city); the size of the firm where workers are employed; workers' age, gender, years of schooling, occupation, hours worked and wages for the population aged 15 years or more and the unit of observation are the households. The data set has a rotary panel component in which each household should appear for five consecutive quarters. After that, the household is eliminated from the sample, and another household substitutes it. Each quarter sample by itself is a cross-section data set.

The sample is restricted to the years from 2005 to 2020 first quarter. Before 2005 the Mexican Employment Survey had two drawbacks: it was not nationally representative until 2000 and changed its methodology in 2005. To avoid comparability problems, this research makes use of 2005 data. [18] The National Labor Force Survey has information on educational attainment so that workers can be classified into different education attainment groups. It also has information about labor status, so it is possible to classify them by labor status (formal or informal), age groups, and

[17] Both data sources are collected by the *Instituto Nacional de Estadística y Geografía* (INEGI).

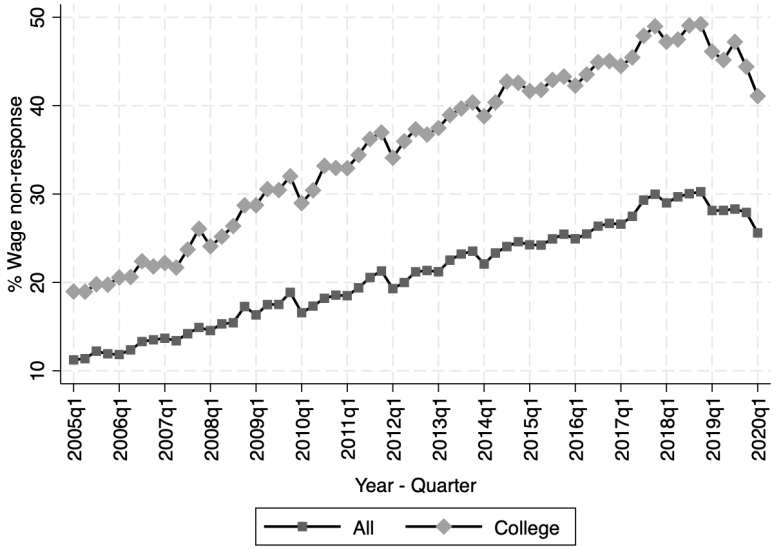
[18] The labor force survey reached national coverage until 2000 and was called *National Employment Survey* (ENE) until 2004. After that, it became the National Survey of Occupation and Employment (ENOE).

educational attainment: primary, junior high, senior high, and college. It also has information on occupations, so workers are classified into different skill levels using the occupations to measure skills. The sample is restricted to workers between 15-65 years old with a positive wage. Real wages are computed in 2012 pesos.

The Economic Census is a firm-based data set published every five years. It has information at the national, state, and municipal level on the total number of workers, the aggregate of earning, and social security payments classified by the North America Industrial Classification System (NAICS) [19]. The observation unit is the establishments, and the periodicity of the Economic Census is every five years. The information of the Economic Census will be classified per economic sub-sector at the three-digits NAICS.

An important limitation of the ENOE is that there is an increasing trend over time in item non-response for labor income (not presented in ENIGH); see (Campos-Vázquez, 2013a; Campos-Vazquez & Lustig, 2017). If the proportion of people with item non-response for labor income is a random sample, this will not affect the measurement of wage inequality. Nevertheless, in Mexico, according to Campos-Vázquez (2013a), this is not the case. The item non-response for labor income is more significant and increasing for college-educated people, so income could be biased downward in the non-corrected survey as those not reporting earnings are not a random sample of the surveyed population.

Figure 1: Non-Response on Labor Income Variable.
ENOE 2005-2020Q1



Source: Author's own elaboration using ENOE 2005Q1-2020Q1.
Note: Non-Response is defined as paid workers that do not report its income or report it as zero.

To construct the instrumental variable, this research use information from the BACI international trade database Gaulier and Zignago (2010) from 2002-2018, which is reported using the 2002 World Customs Organization's Harmonized System (HS) classification at the 6-digits. Upper-middle income countries are defined as developing countries, and High-income countries are defined as developed, following World Bank's income classification. The data for exports from Mexico by sector is also obtained from the BACI international trade database. The unit of observation used in this research is the Metropolitan Zone. To group the observations at the Metropolitan Zone level, the 2005

[19] Mexico's Economic Census started using this classification system in the 1999 census before was used a national classification system.

Metropolitan Zone delimitation of CONAPO is used. The employment data per sector comes from the Economic Census and is presented at the three-digits NAICS sub-sector industry codes at the municipality level, so it is also grouped at the Metropolitan Zone level. The HS classifies products solely on physical characteristics, while NAICS classifies products based on physical characteristics and the type of economic activity. This creates a potential difficulty when linking trade (HS) and production/employment data (NAICS). Another problem with the data is that the Mexican Labor Force survey classification of occupations changed in the second quarter of 2012. The occupation variable was presented using the Mexican Classification of Occupations (CMO, by its Spanish acronym). However, since the third quarter of 2012, the occupation variable uses a new classification, the National System of Classification of Occupations (SINCO, by its Spanish acronym). This requires addressing this change in the occupations classification. The details to address these problems are presented in the next subsection.

3.1 Data correction

The correction for item non-response in the labor income variable in ENOE follows from Campos-Vázquez (2013b), which recommends using the hot-deck imputation because of its easy implementation and its computational efficiency imputing missing values. The hot-deck correction requires using different groups. This research divide by gender, social security status, education attainment levels, auto represented city, and a variable of wage in terms of the minimum wage. [20] It is important to note that even with the hot-deck imputation, the distribution can still be biased downwards because this method imputes missing values with observed values of the different groups. Suppose the upper tail of the distribution does not report their labor income. In that case, this method cannot impute high-income workers' wages because it imputes observed values to the missing values.

To address the problem of linking trade data with production/employment data, the concordance generated by Pierce and Schott (2012) that can be found in his data webpage is used. The concordance links the 10-digits HS reported for United States imports with 6-digits NAICS. [21] The first 6-digits of the HS concordance and the first 3-digits of NAICS are kept to have information at the sub-sector level. After that, the 6-digits of the HS are grouped by 3-digits of the NAICS to link the data from the BACI international trade database to the Economic Census data for employment for Mexico's metropolitan zones by sector. The observations of the sub-sector of Oil and Gas extraction are dropped to avoid outliers due to the sharp decline in Mexico's oil production since 2007. To address the change in occupations classification, the concordance tables provided by INEGI are used. Then, occupations are aggregated into 18 broad defined occupations, and workers with an unspecified occupation are dropped.

[20] Some of the surveyed population chose not to answer the question on wages, but they do answer in terms of the minimum wage.

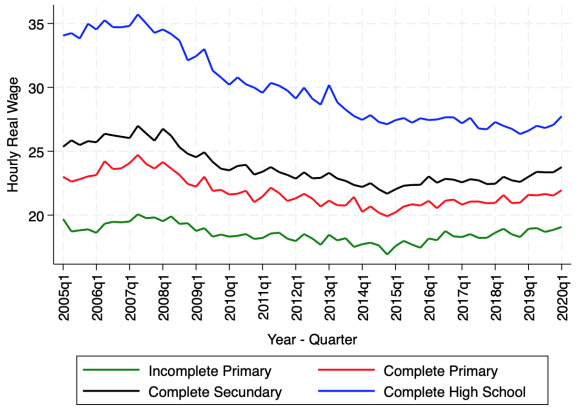
[21] The first 6-digits represent the international classification; more digits are allowed to vary between countries for more useful classification.

4 Descriptive Analysis

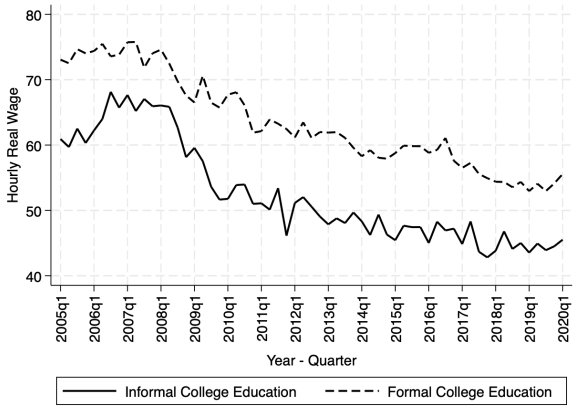
During the period analyzed, real wages for the different educational levels fell as shown in figure 2. From figure 2b it can seem that workers with the same education employed in the informal sector receive a lower wage compared to their peers employed in the formal sector. That is, informality has a penalization on wages, even between the most educated workers. In these figures, we can also see that, even though the wages decrease for all the educational groups after the financial crisis, it decreases more for the people with higher education and faster, as shown in figure 3a.

Figure 2: Hourly Wages

(a) Hourly Labor Income
Less than College



(b) Hourly Wage by Social Security Status
College Educated



Source: Author's own elaboration using ENOE 2005Q1-2020Q1. *Notes*: Both figures are elaborated using the original survey without Hot-Deck imputation for missing values on labor income variable. Sample restricted to workers between 18-65 years old with valid labor income.

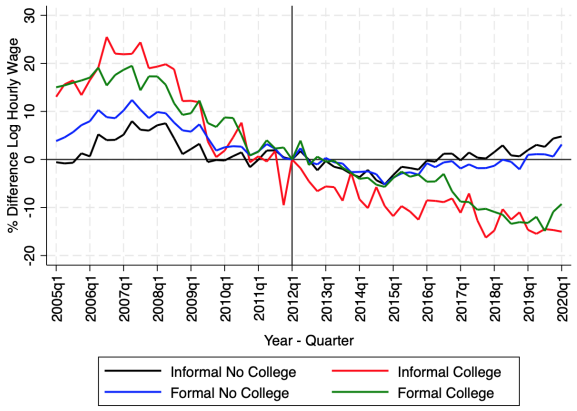
From figure 3a we can also note that the most affected group during this period were the informal workers with a college education. This supports Levy and Lopez-Calva (2016) hypothesis that the informal sector generates a misallocation that affects more wages of workers with higher education. Another significant result from figure 3a is that the less affected group are informal workers without a college education. This result is impressive as workers employed in the informal sector earn less than workers with similar characteristics. This can be explained by a change in the demand of informal firms, which are less intensive in skills than formal firms, as shown in figure 3b.

In figure 3b can be observed that formal and informal employment is relatively stable during this period and that there is a wide gap between workers with and without a college education. College-educated workers get employed more in the formal sector than non-college workers. Another interesting fact is that after 2008 with the financial crisis, formal employment for people without college education decreased and remained lower than before the crisis. However, for college-educated people, this did not happen.

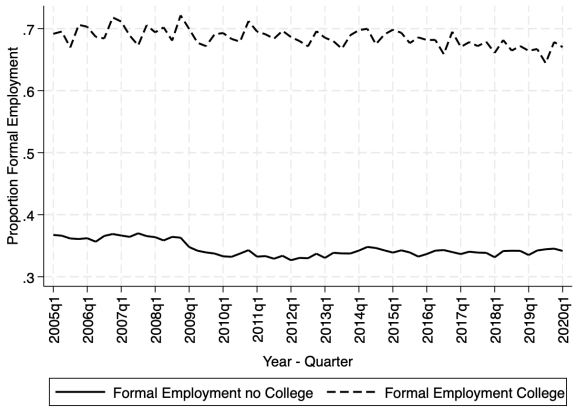
It seems that informality can play an essential role in explaining what had happened to the relative returns or wage structure in Mexico in the last fifteen years. Nevertheless, informality cannot fully explain what had happened, and it is important to analyze different factors. Another important mechanism that has been extensively analyzed and is analyzed in this research is globalization.

Figure 3: Change in wages and formal employment

(a) Difference Log Hourly Wage
Base: 2012 First Quarter



(b) Formal Employment
College vs Less than College



Source: Author's own elaboration using ENOE 2005Q1-2020Q1. *Notes*: Figure 3a presents the log difference between mean wage for different types of workers in each quarter and the mean wage for the same types of workers in the first quarter of 2012. Figure 3b presents the proportion of formal workers by schooling level. Sample restricted to workers between 18-65 years old with valid labor income.

4.1 Occupations

An alternative measure of skills, instead of education, are occupations. The occupational approach avoids the bias generated due to the substantial increases in Mexico's college enrollment rates. Using occupations allows to group workers by skill levels that are not affected by changes in the labor force's educational composition. The approach is as follows: The occupations are sorted by the proportion of workers with finished high school or higher in the initial year 2005. As the percentage of workers with higher education at the upper tail of low-skill occupations is similar to the lower tail of the medium-skill occupations, the cutoff is chosen at the *Personal service workers* to avoid assigning occupations at the medium-skill level that were low-skill in 1992 according to Campos and Rodríguez (2011) ranking. [22]

Table 1 shows the rankings according to this definition. Workers are classified into 18 occupations and three skill levels: low-skill, medium-skill, and high-skill. The lowest-ranked occupations are agriculture and forestry workers, while the highest-ranked occupations are the professionals. It can be noted that there is a jump in the percentage of workers with higher education between medium-skill workers and high-skill. In contrast, for low-skill and medium-skill workers, the difference between these percentages is smaller.

Figure 4 show two interesting results. It can be observed in figure 4b that workers with higher skills are more often employed in the formal sector, especially the high-skill workers. Nevertheless, in figure 4a, the wages of medium-skill and low-skill workers are almost the same, with a substantial difference with high-skill workers. These results suggest that during the last 15 years, a wage polarization happened in Mexico as wages for the medium-skill workers are now nearly equal to low-skill workers' wages.

[22] In particular, this cutoff is chosen to avoid assigning *Machinery and transportation workers (drivers)* and *Street workers* as medium-skill occupations as in 1992 those two were the lowest-ranked occupations by education in Campos and Rodríguez (2011) ranking.

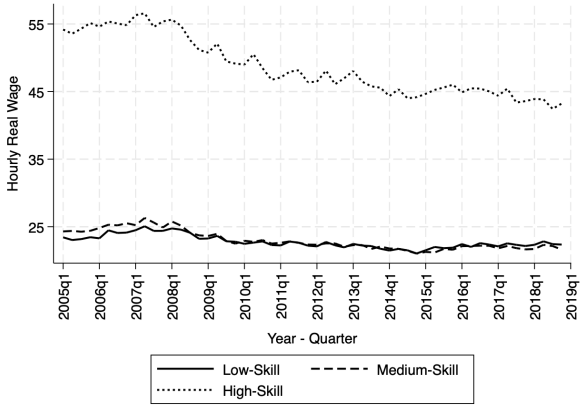
Table 1: Occupations by Skill Ranking

Occupations	Percentage of Workers with Higher Education	Skill Levels
Agriculture and forestry workers	5.28	Low-Skill
Domestic service workers	7.7	Low-Skill
Manufacturing: blue collars (helpers)	9.9	Low-Skill
Manufacturing: blue collars (repair, maintenance)	15.18	Low-Skill
Manufacturing: blue collar (machine operators)	16.5	Low-Skill
Street workers	17.49	Low-Skill
Machinery and transportation workers (drivers)	19.58	Low-Skill
Personal service workers	19.69	Medium-Skill
Protective service workers	21.78	Medium-Skill
Sales workers	32.23	Medium-Skill
Manufacturing: white collars (supervisors, quality)	55.11	High-Skill
Arts and sports workers	57.64	High-Skill
Clerical support workers	62.04	High-Skill
Technicians	72.38	High-Skill
Management and service supervisors	75.46	High-Skill
Managers in the government and private sector	82.39	High-Skill
Education workers	95.48	High-Skill
Professionals	99.88	High-Skill

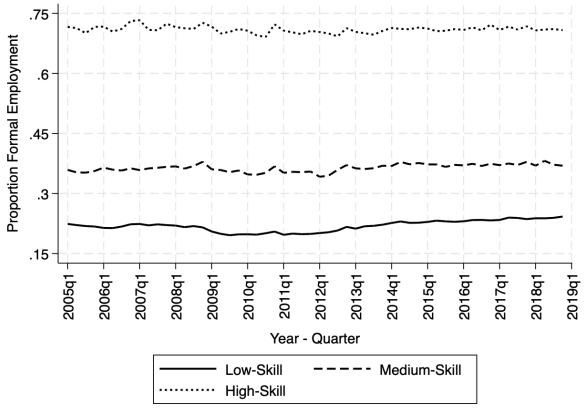
Note: Rankings are based in 2005 data, with the first one corresponding to the lowest-skill occupation and last one to the highest-skill occupation. The ranking is based on the percentage of workers with finished high-school education or higher and (Campos & Rodríguez, 2011) rankings of occupations based in 1992 data to avoid assigning Low-Skill occupations to Medium-Skill occupations in 1992 and vice versa.

Figure 4: Skill Levels

(a) Hourly Labor Income Less by Skill Levels



(b) Proportion of Formal Workers by Skill Levels

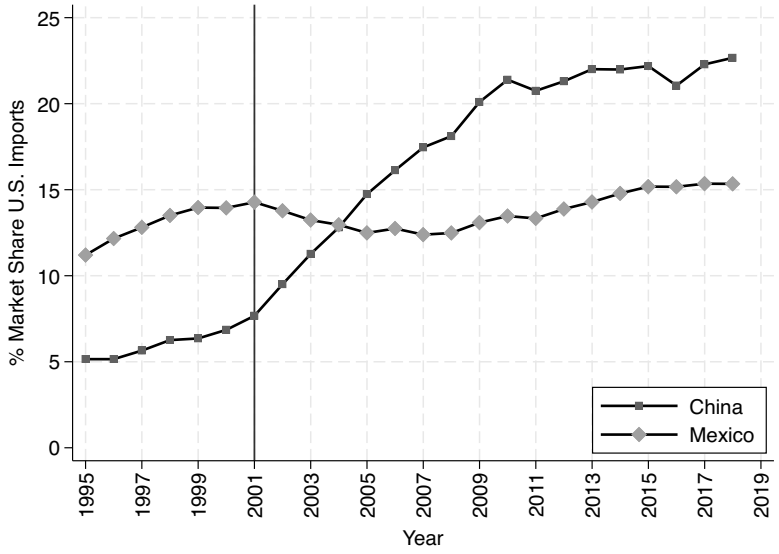


Source: Author's own elaboration using ENOE 2005Q1-2020Q1. *Notes*: Figure 4a is elaborated using the original survey without Hot-Deck imputation for missing values on labor income variable. Sample restricted to workers between 18-65 years old with valid labor income. The skill levels used are presented in table 1.

4.2 China's export growth

Figure 5 presents the market share of U.S. imports from China and Mexico. It can be noted that with China's accession to the World Trade Organization (WTO) in 2001, Chinese exports to the U.S. increased substantially. This increase in Chinese exports resulted in Mexico's exports facing more vigorous competition in foreign markets as Mexico is specialized in industries and activities in which China exhibits a comparative advantage.

Figure 5: Market Share in Non-Oil U.S. Imports



Source: Author's own elaboration using BACI International Trade Database from 1995-2018.
Note: Data from BACI International Trade Database can differ from United Nations Comtrade database. For specific information refer to Gaulier and Zignago (2010). Exports from China includes the Special Administrative Regions (SAR) of the People's Republic of China, Hong-Kong and Macau. The vertical line represents the year of China's accession to the World Trade Organization (WTO).

As pointed by G. H. Hanson (2010), for Mexico, China's export growth represents a threat to the Mexican economy as both countries specialize in similar goods. Another problem is that nearly half of Mexico's manufacturing exports as of 2006 were produced by export assembly plants, which import inputs from abroad, assemble or process the inputs into final outputs, and then export the finished goods. In contrast with other countries that based their development on exports and began industrial development with heavy reliance on export assemblies, such as Hong Kong or Taiwan, their firms later changed to original-equipment manufacture and own-brand production. Mexico has progressed from assembly very low-skill intensive products to assembling electronics or auto parts; however, it has not made the transition to export own-brand products. Hence, the country remains exposed to import competition from China, whose abundance in low-skilled labor gives China comparative advantages in labor-intensive products.

The descriptive analysis presented in this section shows that the informal sector, the level of skills, and globalization measures may explain some of the wage structure changes. The following section presents the exposure measures related to two globalization measures: Chinese competition in U.S. markets and increasing export opportunities with local labor market outcomes for formal and informal workers with different skill levels.

5 Exposure Measures

This section describes the construction of the two measures of exposure to globalization and the intuition behind them. These exposure measures follow from Chiquiar et al. (2017) and Autor et al. (2013). Chiquiar et al. (2017) estimate the effect of China import competition on U.S. markets and NAFTA on Mexico's local labor markets while Autor et al. (2013) estimate the effect of the increase in Chinese exports to the U.S. on U.S. commuting zones by exploiting the variation in the degree of exposure of different local U.S. labor markets to the increase in those exports. Following this approach is assumed that Mexico's local labor markets were differently affected by the increase in Chinese exports to the U.S. to the extent that they differed in the degree to which they were previously specialized in producing the goods in which the U.S. exhibited the largest imports increases from China. This approach will also be used to analyze the effect of Mexican exports from 2004 to 2018. In particular, to identify the effect of Mexican exports on labor markets during 2004-2018 is assumed that the local markets previously specialized in the sectors that later experienced increasing exports may have exhibited a larger response than the rest of the country.

These two exposure measures represent two crucial channels in which increased trade can affect the labor markets; it can affect by the increased market access, and it can also affect by imported competition in foreign markets. Most of Mexico's exports are unskilled intensive products that go to the U.S., so increased exports from China to the U.S. can affect Mexico's local labor markets by the competition that it generates on Mexican unskilled intensive tradable products.

Two local exposure measures to international trade are computed: i) Exposure to Chinese competition in U.S. markets, and ii) exposure to globalization, measured with Mexican exports. In particular Mexican metropolitan zones or labor markets are indexed by i and different sector by j, and let ΔIM_j^{USChn} be the dollar valued change in U.S. imports from China of goods from sector j from 2004-2018. The index of Chinese competition Exposure (ΔICC_i^{US}) of local labor market exposure of metropolitan zone i to the increase of Chinese exports to the U.S. as:

$$\Delta ICC_i^{US} = \frac{1}{E_i} \sum_j \frac{E_{ij}}{E_j} \Delta IM_j^{USChn} \tag{1}$$

Where E_{ij} represents the number of workers in industry j in metropolitan zone i in 2004, which is the start of the period year. E_j is the number of workers at the national level in industry j also at the start of the period. Finally, E_i is the total number of workers in metropolitan zone i in the same starting year. The idea behind this index is the following. If 10 % of Mexican employment of sector j was located in the metropolitan area i then this will be the weight of metropolitan zone i for sector j. Metropolitan zones with a higher share of employment in the sectors in which China increased more its exports to the U.S. will have a higher index. After doing this for every sector, sum over all sectors to obtain $\sum_j \frac{E_{ij}}{E_j} \Delta IM_j^{USChn}$ and then the expression is divided by the initial total number of workers in metropolitan zone i E_i to obtain a per-worker measure of local exposure to Chinese competition.

The intuition behind it is that a metropolitan zone i will be more exposed to Chinese competition, and thus will have a higher index, to the extent that its labor force was, in the start year, more concentrated in a sector where Chinese exports increased the most from 2004 to 2018.

It is important to note that as in Chiquiar et al. (2017), this research only considers that Chinese exports affected Mexico's labor market through the adverse effects that Chinese exports to the U.S. may have on Mexican exports to the U.S. markets, and not a direct effect through Mexican imports from China. The contribution to previous literature from

this work is to extend the period considered, consider if these exposure measures have differentiated effects for formal and informal workers by the level of education, and using an alternative measure of skills such as occupations.

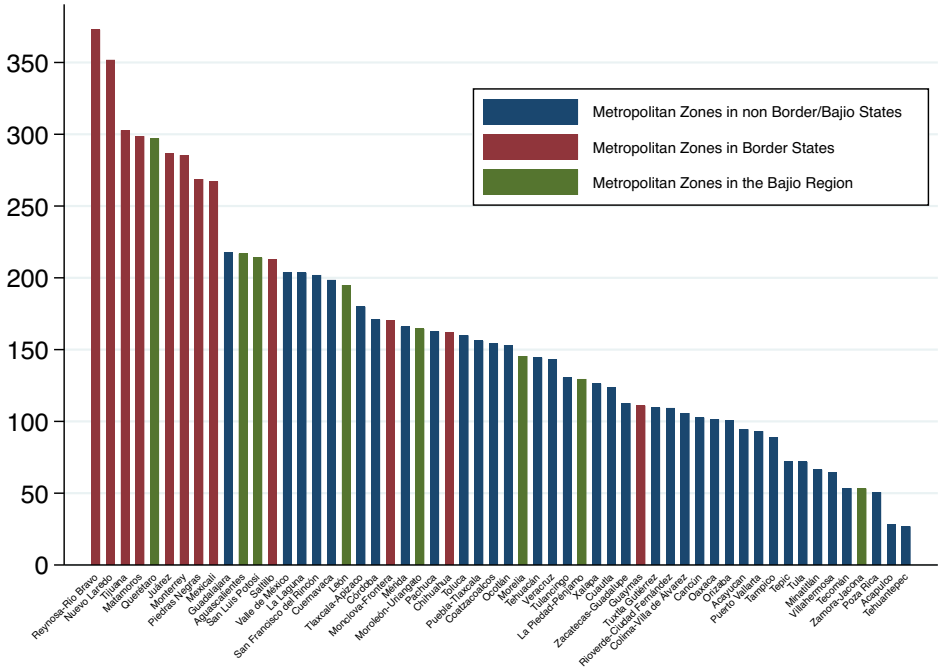
Analogously, a measure of local market Index of Globalization Exposure (ΔIGE_i^{Mx}) is constructed as follows:

$$\Delta IGE_i^{Mx} = \frac{1}{E_i} \sum_j \frac{E_{ij}}{E_j} \Delta X_j^{Mx} \tag{2}$$

Where ΔX_j^{Mx} represents the dollar value increase in Mexican exports from 2004-2018 and the number of workers E_i, E_{ij}, E_j have the same meaning as above. Again, the intuition behind the index is that the labor market in metropolitan zone i was more exposed to globalization market expansion during these years to the extent that its labor force was initially more concentrated in producing goods of the sectors that exhibited larger export increases from Mexico during these years.

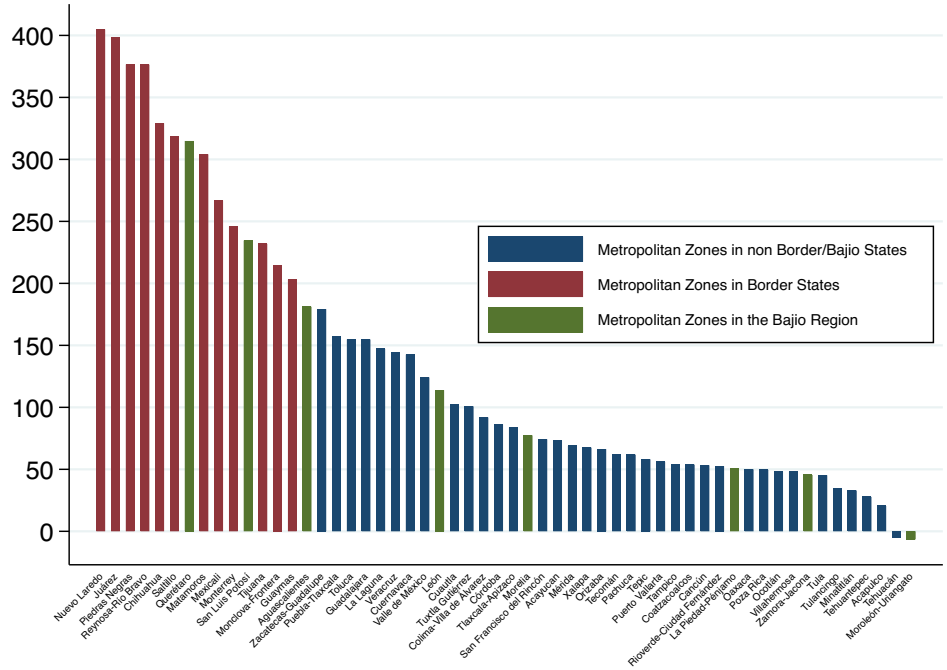
In figures 6 and 7, the previous mentioned indices are presented for the different Mexican metropolitan zones. We can see that metropolitan zones that belong to the border region are more exposed to trade integration and competition from China than those in non-border states. This can suggest that in Mexico, there are geographical differences in the exposition to globalization measured by both trade integration and competition from China indices.

Figure 6: Exposure to Chinese Competition in U.S. Markets



In figure 8 we can see a negative correlation between the difference in log hourly wages of low-skill informal workers and the initial exposure to Chinese import competition and the initial globalization exposure measure. The negative correlation between the initial globalization exposure results counter-intuitive as more export opportunities should positively affect wages. Nevertheless, during this period, the financial crisis happened, and all the workers lost in terms of wages, so it can be the case that metropolitan zones with higher initial exposure to globalization suffer more from the financial crisis as they were more exposed to the global economy. These figures suggest a relation between the

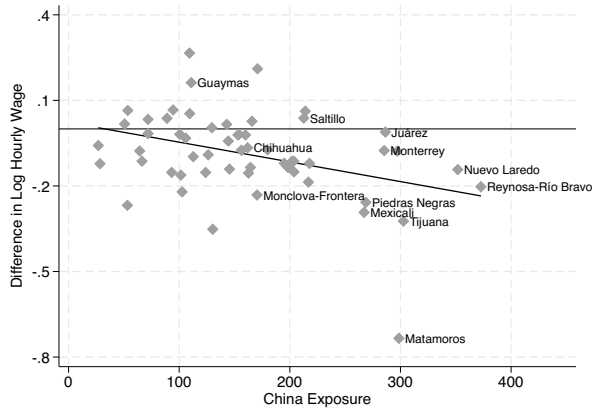
Figure 7: Exposure to Global Markets (Mexican Exports)



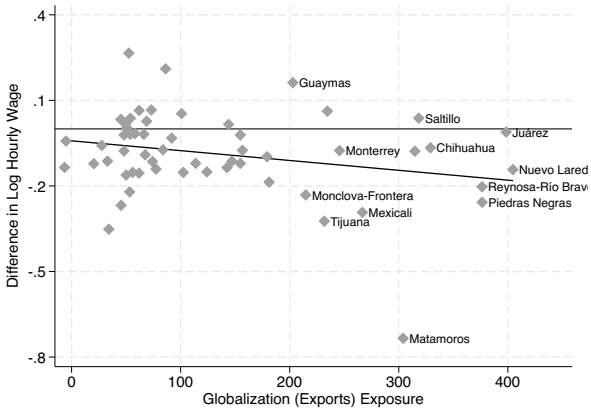
initial exposure indices and the differences in log wages for low-skill informal. To analyze this relation more concretely, the following section presents the empirical strategy.

Figure 8: Scatter Exposure Measures and Wages

(a) Difference Log Hourly Wage
China Exposure



(b) Difference Log Hourly Wage
Globalization Exposure



Source: Author's own elaboration using ENOE years 2005 and 2018, and BACI international trade database. *Notes*: Both figures display the scatter plot of the difference in the logarithm of mean wage for low-skill informal workers in the Metropolitan Zones and the exposure measures. The points with names represents Metropolitan Zones that belong to states in the border with the United States. The line represents a simple linear regression of differences in log mean hourly wage and the exposure measures.

6 Empirical Strategy

This research uses an instrumental variable approach to identify the effects of increased exposure to Chinese import competition on U.S. markets and the effect of globalization exposure, measured as increased Mexican exports.

In particular, to estimate the effect of Chinese competition in the U.S. market on Mexico's local labor markets, equations of the form are estimated:

$$\Delta y_i = \alpha + \beta \Delta ICC_i^{US} + \gamma X_i + \varepsilon_i \tag{3}$$

Where Δy_i is the change from the baseline year 2005 to 2018 of the dependent variable for each metropolitan zone. In this case: Change in wages and employment for workers with different skill levels for both formal and informal workers. X_i is a vector of variables to control for different trends across metropolitan zones, such as the initial proportion of formal workers and the initial proportion of workers with a college education. ΔICC_i^{US} is the variable of interest, which is the index of exposure to Chinese competition on U.S. markets and is defined in equation 1.

Similarly, to estimate the effect of Mexican globalization exposure, measured as exports, equations of the form are estimated:

$$\Delta y_i = \alpha + \beta \Delta IGE_i^{Mx} + \gamma X_i + \varepsilon_i \tag{4}$$

Where all the variables have the same definition as above, except for the variable of interest that is ΔIGE_i^{Mx} and represents the index of globalization exposure and is defined in equation 2.

The problem estimating equation 4 by Ordinary Least Squares (OLS) is that the estimates of β can be biased if there are omitted variables correlated both with wages and Mexican exports. More specifically, consider the following. Metropolitan zones with highly educated people would be more likely to attract; firms that export, Foreign Direct Investment (FDI), and become export hubs. This would lead to OLS estimates that are upward biased. However, if public policy encourages exporting in metropolitan zones with less educated people, then the OLS estimates would be biased downward. The problem estimating equation 3 by (OLS), as in the case of Autor et al. (2013) is the risk of simultaneity bias. This bias can arise from positive shocks to U.S. product demand, which could lead to a positive correlation between wages and employment and imports from China, then estimating the equation by OLS would lead to biased coefficients.

An instrumental variable approach is used to identify the effect of both exposition measures on the wage structure and employment. In particular, to estimate the effect of increasing Chinese exports to the U.S on Mexican labor markets, this research follows Autor et al. (2013). To instrument for the measured Index of Chinese competition Exposure ΔICC_i^{US}, a *non*-U.S. exposure variable ΔICC_i^{OC} that is constructed using exports from China to other high-income countries as follow is used:

$$\Delta ICC_i^{OC} = \frac{1}{E_i} \sum_j \frac{E_{ij}}{E_j} \Delta IM_j^{OCChn} \tag{5}$$

This expression differs from 1 because instead of using U.S. imports from China by industry ΔIM_j^{USChn}, it uses realized imports from China to other high-income countries ΔIM_j^{OCChn}. [23]

To estimate the effect of Mexican globalization exposure, another Bartik-Type instrument is constructed. This instrumental variable will isolate changes in Mexican exports that are not driven by local factors. The instrument will be based on the sectoral patterns in developed countries' demand for developing countries' exports, excluding Mexico.

[23] The other high-income countries are Australia, Denmark, Finland, Germany, Japan, New Zealand, Spain, and Switzerland.

The instrumental variable will take the following structure:

$$\Delta IGE_i^{\widehat{Mx}} = \frac{1}{E_i} \sum_j \frac{E_{ij}}{E_j} \Delta X_j^{\widehat{Mx}} \tag{6}$$

Where $\Delta X_j^{\widehat{Mx}}$ represents the predicted dollar value increase in Mexican exports from 2004 to 2018, and the predicted exports are generated as follows:

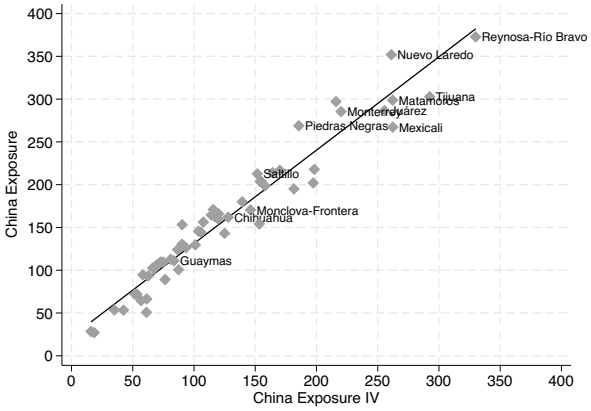
$$X_j^{\widehat{Mx}} = exports_{j,0} \times (1 + \phi_{j,t}) \tag{7}$$

Where $\phi_{j,t}$ is the growth rate of sector j exports from developing countries (excluding Mexico) to developed countries from the initial year 2004 to 2018.[24] Thus, Metropolitan Zone level changes in the instrument are not driven by local factors but only by the export trend from other developing countries.

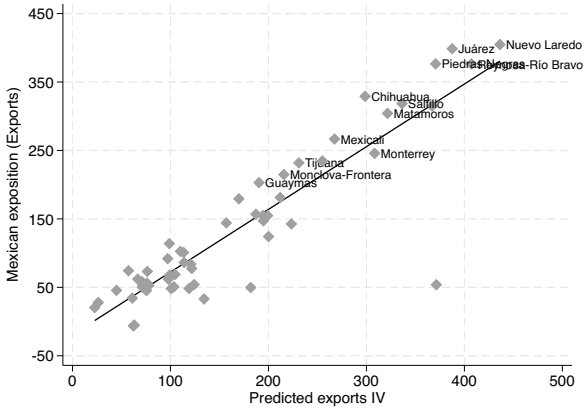
Figure 9 shows that the two original exposure measures are positively correlated with the corresponding measures used as instruments. It can be noted that the metropolitan zones that belong to the border states are the ones that have higher exposition according to both indices. More formally, in table 2, the first stage regression results are presented, and the null hypothesis of weak instruments is rejected with the first-stage F-statistic.

Figure 9: First Stage Scatters

(a) China Exposure



(b) Globalization Exposure



Source: Author's own elaboration using BACI international trade database. *Notes*: Both figures display the scatter plot of the exposure measures and its instrument. The points with names represents Metropolitan Zones that belong to states in the border with the United States. The line represents a simple linear regression of the exposure measures and its instrumental variable.

The following section describes the empirical results obtained for the effect of the degree of exposure to Chinese competition in the U.S. market on local labor markets. Then the results obtained for the effect of Mexican globalization exposure are presented. This section also presents the results using a different measure of skills for both measures. In both cases, this research focus on the effect on employment and wages for different types of workers.

[24] Developed countries will be defined as High-income countries and developing countries as Upper-middle income according to the data from the World Bank.

Table 2: First Stage Regressions

	(1) Globalization Exposure	(2) China Exposure
Globalization Exposure Instrument	0.716***	
	[4.96]	
China Exposure Instrument		1.107***
		[21.20]
Constant	-54.21***	18.61**
	[-2.86]	[2.16]
Controls	Yes	Yes
R-squared	0.842	0.941
Observations	56	56
F-statistic	24.60	449.44

t statistics in brackets
Robust Standard Errors.
The controls include: Proportion of formal workers, and proportion of people with a college education both in the initial year 2005.
* p<0.1, ** p<0.05, *** p<0.01

7 Results

7.1 China Exposure

Table 3 summarizes the effect of Chinese competition on U.S. markets on hourly wages for different types of workers. There is a negative and statistically significant effect of Chinese exposure on wages for informal workers without a college education and no significant effect on wages for other types of workers, nor the mean wage. Concerning the skill premium, which is the ratio between wage for skilled workers (college-educated) and unskilled workers (less than college), there is a positive effect on informal workers' skill premium. However, there is no effect on formal worker's skill premium. Table 4 presents the results for Monthly wages. The same results are found, but now there is not a significant effect on the skill premium for informal workers, in contrast with hourly wages. This can be due to changes in worked hours. Then the effects on employment are analyzed.

Table 3: China Exposure: Difference Log Hourly Wage.

	(1) Mean Wage	(2) Informal No College	(3) Informal College	(4) Formal No College	(5) Formal College	(6) Skill Premium Formal	(7) Skill Premium Informal
China Exposure	-0.0412	-0.0664*	0.0269	-0.0225	-0.00134	0.0212	0.0930*
	[-1.40]	[-1.89]	[0.49]	[-1.01]	[-0.04]	[0.57]	[1.69]
Constant	-0.756	0.0312	-0.340*	-0.0827	-0.190	-0.107	-0.343
	[-0.09]	[0.36]	[-1.83]	[-1.03]	[-1.42]	[-0.95]	[-1.41]
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.091	0.151	0.1	0.3	0.036	0.020	0.033
Observations	56	56	55	56	56	56	55

t statistics in brackets
All regressions are estimated using two stage least squares instrumental variables.
Robust Standard Errors.
The coefficients of interest are multiplied by 100 for interpretation purposes.
The controls include: Proportion of formal workers, and proportion of people with a college education both in the initial year 2005.
* p<0.1, ** p<0.05, *** p<0.01

Table 4: China Exposure: Difference Log Monthly Wage

	(1) Mean Wage	(2) Informal No College	(3) Informal College	(4) Formal No College	(5) Formal College	(6) Skill Premium Formal	(7) Skill Premium Informal
China Exposure	-0.0300	-0.0588*	0.0150	-0.0223	-0.00667	0.0156	0.0736
	[-0.99]	[-1.69]	[0.26]	[-0.91]	[-0.24]	[0.50]	[1.29]
Constant	-0.0410	0.0203	-0.476***	-0.0462	-0.112	-0.0662	-0.469**
	[-0.45]	[0.22]	[-2.82]	[-0.71]	[-0.66]	[-0.41]	[-2.13]
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.067	0.210	0.010	0.016	0.054	0.020	0.053
Observations	56	56	55	56	56	56	55

t statistics in brackets
All regressions are estimated using two stage least squares instrumental variables.
Robust Standard Errors.
The coefficients of interest are multiplied by 100 for interpretation purposes.
The controls include: Proportion of formal workers, and proportion of people with a college education both in the initial year 2005.
* p<0.1, ** p<0.05, *** p<0.01

Table 5 summarizes the effect of Chinese competition on U.S. markets on employment. There is a negative and significant effect on the differences in log employment for informal workers with and without a college education and formal workers with a college education. However, there is no effect on formal workers without a college education. It is important to note that substantial increases in college enrollment happened during the study period, which can influence the distribution of workers in each category. Another issue worth mentioning is that during the study period, the 2008 financial crisis happened, so it is essential to consider this effect when interpreting the results.

Table 5: China Exposure: Difference Log Employment

	(1) Informal No College	(2) Informal College	(3) Formal No College	(4) Formal College
China Exposure	-0.256**	-0.211**	-0.101	-0.323**
	[-2.65]	[-2.02]	[-1.17]	[-2.28]
Constant	-0.294	0.676*	-0.134	0.386
	[-0.78]	[1.71]	[-0.39]	[0.98]
Controls	Yes	Yes	Yes	Yes
R-squared	0.235	0.085	0.092	0.158
Observations	56	55	56	56

t statistics in brackets
All regressions are estimated using two stage least squares instrumental variables.
Robust Standard Errors.
The coefficients of interest are multiplied by 100 for interpretation purposes.
The controls include: Proportion of formal workers, and proportion of people with a college education both in the initial year 2005.
* p<0.1, ** p<0.05, *** p<0.01

The interpretation of the coefficients' size will be as in Autor et al. (2013) using a gap measure of the exposition indices. The exposition indices' gap measure will be between the 75^{th} and 25^{th} percentiles. That is, the effect that Chinese import competition exposure would have on wages and employment if a Metropolitan Zone with an exposure measure in the 25^{th} increased its exposure to the level of a Metropolitan Zone in the 75^{th} percentile.

In particular, if the Chinese competition exposure index increased from the level of the 25^{th} percentile to the level of the 75^{th} percentile [25]: a) Hourly mean wage for non-college informal workers would decrease by 6.74% and the

[25]The exact interpretation of the coefficients is as follows: $\%\Delta y = (e^{\beta} - 1) \times (\Delta ICC^{Us}_{Chn} Gap) \times 100$ where $\Delta ICC^{Us}_{Chn} Gap$ is the difference between the 75^{th} and 25^{th} percentiles for the Chinese competition exposure index and is equal to 101.60487, and β

hourly skill premium for informal workers would increase by 9.45%; b) Monthly mean wage for non-college informal workers would decrease by 5.97% with no significant effect on the monthly skill premium for informal workers, and c) Employment for non-college informal workers would decrease in 25.97%, employment for informal workers with a college education in 21.41%, employment for formal workers with a college education in 32.76%, and no significant effect on employment for non-college formal workers.

The results presented before may differ from Chiquiar et al. (2017) for several reasons. First, the analyzed period is different. Chiquiar et al. (2017) analyze the period of 2000-2008, while this research study the period of 2004-2018, in which different things that can affect the results happened, such as the financial crisis of 2008 and increased college enrollment. Also, as shown in figure 1, during this period, the non-response in the labor income variable of the ENOE increased substantially so that the results can differ due to this problem. Another difference is the definition of skill used in this work. This research uses college education as a measure of skills, instead of high school education and occupations as an alternative measure of skills. Finally, differences between formal and informal workers are allowed. Nevertheless, the estimated effects for the statistically significant coefficients are similar in magnitude to the ones from Chiquiar et al. (2017).

7.2 Globalization Exposure

This subsection presents the results of the estimation for the Index of Globalization Exposure. Table 6 summarizes the results of the instrumental variables estimation for hourly wages. Any statistically significant effect of globalization exposure on hourly wages is found. Table 7 presents the results for monthly wages. The same results can be observed for hourly wages, not statistically significant effect of globalization exposure on wages. Increasing export opportunities is expected to positively affect wages, while increasing competition in foreign markets is expected to harm wages. Nevertheless, no significant effect of increasing export opportunities on wages is found. There is only a significant and negative effect of increasing competition in foreign markets. These results suggest that during the 2004-2018, globalization decreased wages by China's imported competition on foreign markets with no positive effects of increasing export opportunities.

Table 6: Globalization Exposure: Difference Log Hourly Wage

	(1) Mean Wage	(2) Informal No College	(3) Informal College	(4) Formal No College	(5) Formal College	(6) Skill Premium Formal	(7) Skill Premium Informal
Globalization	-0.00189	0.00860	0.139	-0.00542	-0.00223	0.00319	0.134
Exposure	[-0.06]	[0.28]	[1.40]	[-0.14]	[-0.06]	[0.07]	[1.41]
Constant	-0.0245	0.0157	-0.158	-0.0964	-0.193	-0.0965	-0.145
	[-0.26]	[0.17]	[-0.60]	[-1.05]	[-1.29]	[-0.72]	[-0.45]
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.073	0.108	.	0.008	0.035	0.028	.
Observations	56	56	55	56	56	56	55

t statistics in brackets
All regressions are estimated using two stage least squares instrumental variables.
Robust Standard Errors.
The coefficients of interest are multiplied by 100 for interpretation purposes.
The controls include: Proportion of formal workers, and proportion of people with a college education both in the initial year 2005.
* p<0.1, ** p<0.05, *** p<0.01

represents the original β that is the presented in the tables divided by 100. In a log-linear model, for small β, the effect of x on the dependent variable can be approximated as: $\%\Delta y = 100 \times \beta \times \Delta x$. The coefficients are multiplied by 100, so the interpretation is: $\%\Delta y = \beta \times \Delta ICC^{Us}_{Chn} Gap$. The interpretations presented are the exact calculation.

Table 7: Globalization Exposure: Difference Log Monthly Wage

	(1) Mean Wage	(2) Informal No College	(3) Informal College	(4) Formal No College	(5) Formal College	(6) Skill Premium Formal	(7) Skill Premium Informal
Globalization	0.00385	0.0131	0.0974	-0.0159	0.0141	0.0300	0.0878
Exposure	[0.11]	[0.39]	[1.04]	[-0.41]	[0.36]	[0.65]	[1.08]
Constant	-0.0480	0.0121	-0.350	-0.0705	-0.101	-0.0301	-0.334
	[-0.50]	[0.13]	[-1.59]	[-0.98]	[-0.52]	[-0.17]	[-1.22]
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.062	0.189	.	0.032	0.060	0.056	0.034
Observations	56	56	55	56	56	56	55

t statistics in brackets
All regressions are estimated using two stage least squares instrumental variables.
Robust Standard Errors.
The coefficients of interest are multiplied by 100 for interpretation purposes.
The controls include: Proportion of formal workers, and proportion of people with a college education both in the initial year 2005.
* p<0.1, ** p<0.05, *** p<0.01

Table 8 presents the results of the effect of globalization exposure on employment. There is a negative and significant effect on the differences of log employment for formal workers with a college education, and a significant effect for informal workers without a college education but no significant effects for other types of workers. The gap measure of the exposition indices between the 75^{th} and 25^{th} percentiles is used to interpret the magnitude of the results presented above.

In particular, if the Globalization exposure index increased from the level of the 25^{th} percentile to the level of the 75^{th} percentile [26]: Employment for formal workers with a college education would decrease by 38.76%, employment for non-college informal workers would decrease by 39.17% and no significant effect on employment for informal workers with a college education and formal workers without a college education.

The results presented in this subsection are consistent with the results of Rodriguez-Castelan et al. (2020), which do not find significant effects on employment nor mean wages using exports from Mexico's municipalities from 2004-2014, which is a period similar to the analyzed in this research. The authors suggest that the lack of effect on average wages is driven by a rise in labor supply at the local level because municipalities with higher export growth experienced an increase in labor force participation and attracted more migration, particularly of unskilled workers. A negative effect is found but just for non-college informal workers' employment and for college-educated formal workers, which are not differentiated in the sample used by Rodriguez-Castelan et al. (2020). That can explain why an effect is found, but just after considering both formal and informal workers.

7.3 Occupations

This subsection presents the results using occupations instead of education as a measure of skills. Using this definition of skills allows to group workers into three skill measures: low-skill, medium-skill, and high-skill. Similar results as presented using education as a measure of skills are found.

[26] The exact interpretation of the coefficients is as follows: $\%\Delta y = (e^{\beta} - 1) \times (\Delta IGE^{Mx}Gap) \times 100$ where $\Delta IGE^{Mx}Gap$ is the difference between the 75^{th} and 25^{th} percentiles for the Globalization exposure index and is equal to 139.12407, and β represents the original β that is the presented in the tables divided by 100. In a log-linear model, for small β, the effect of x on the dependent variable can be approximated as: $\%\Delta y = 100 \times \beta \times \Delta x$. The coefficients are multiplied by 100, so the interpretation is: $\%\Delta y = \beta \times \Delta IGE^{Mx}Gap$. The interpretations presented are the exact calculation.

Table 8: Globalization Exposure: Difference Log Employment

	(1) Informal No College	(2) Informal College	(3) Formal No College	(4) Formal College
Globalization Exposure	-0.282**	-0.242	-0.0703	-0.279**
	[-2.53]	[-1.51]	[-0.65]	[-2.09]
Constant	-0.673	0.303	-0.242	-0.0149
	[-1.50]	[0.56]	[-0.58]	[-0.03]
Controls	Yes	Yes	Yes	Yes
R-squared	0.150	.	0.049	0.064
Observations	56	55	56	56

t statistics in brackets
All regressions are estimated using two stage least squares instrumental variables.
Robust Standard Errors.
The coefficients of interest are multiplied by 100 for interpretation purposes.
The controls include: Proportion of formal workers, and proportion of people with a college education both in the initial year 2005.
* p<0.1, ** p<0.05, *** p<0.01

Table 9: China Exposure: Difference Log Hourly Wage Occupations

	(1) Informal Low-Skill	(2) Formal Low-Skill	(3) Informal Medium-Skill	(4) Formal Medium-Skill	(5) Informal High-Skill	(6) Formal High-Skill
China Exposure	-0.0941**	-0.0272	-0.0323	-0.0137	-0.0377	-0.0735*
	[-2.45]	[-0.91]	[-0.66]	[-0.47]	[-0.61]	[-1.93]
Constant	0.00291	0.0171	0.0327	-0.0592	-0.336	0.00229
	[0.03]	[0.13]	[0.30]	[-0.76]	[-1.48]	[0.01]
Controls	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.092	0.016	0.038	0.002	0.125	0.117
Observations	56	55	56	55	56	56

t statistics in brackets
All regressions are estimated using two stage least squares instrumental variables.
Robust Standard Errors.
The coefficients of interest are multiplied by 100 for interpretation purposes.
The controls include: Proportion of formal workers, and proportion of people with a college education both in the initial year 2005.
* p<0.1, ** p<0.05, *** p<0.01

Table 10: China Exposure: Difference Log Monthly Wage Occupations

	(1) Informal Low-Skill	(2) Formal Low-Skill	(3) Informal Medium-Skill	(4) Formal Medium-Skill	(5) Informal High-Skill	(6) Formal High-Skill
China Exposure	-0.0854**	-0.0319	-0.0256	-0.0172	-0.0683	-0.0524
	[-2.08]	[-1.01]	[-0.48]	[-0.63]	[-1.10]	[-1.55]
Constant	-0.0311	0.0589	0.0438	-0.0973	-0.321*	0.153
	[-0.26]	[0.48]	[0.32]	[-1.19]	[-1.68]	[0.60]
Controls	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.054	0.049	0.107	0.020	0.135	0.157
Observations	56	55	56	55	56	56

t statistics in brackets
All regressions are estimated using two stage least squares instrumental variables.
Robust Standard Errors.
The coefficients of interest are multiplied by 100 for interpretation purposes.
The controls include: Proportion of formal workers, and proportion of people with a college education both in the initial year 2005.
* p<0.1, ** p<0.05, *** p<0.01

For the effect of Chinese competition on foreign markets on wages, a similar effect is found. There is a negative and statistically significant effect for low-skill informal workers, supporting the result found using education. Chinese competition in foreign markets hurts the wages of informal workers without a college education. Now there is also a negative and significant effect on wages for high-skill formal workers. Nevertheless, this effect is only statistically significant in hourly wages. On monthly wages, only the negative effect on low-skill informal workers remains statistically significant. No significant effects on wages for the other types of workers are found.

Table 11: China Exposure: Difference Log Employment Occupations

	(1) Informal Low-Skill	(2) Formal Low-Skill	(3) Informal Medium-Skill	(4) Formal Medium-Skill	(5) Informal High-Skill	(6) Formal High-Skill
China Exposure	-0.311***	-0.0875	-0.212*	-0.260*	-0.121	-0.0960
	[-2.97]	[-0.99]	[-1.94]	[-1.79]	[-1.35]	[-1.19]
Constant	-0.260	0.321	-0.332	-0.380	0.202	0.166
	[-0.71]	[0.65]	[-0.88]	[-0.84]	[0.71]	[0.64]
Controls	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.262	0.012	0.180	0.167	0.068	0.068
Observations	56	55	56	56	56	56

t statistics in brackets
All regressions are estimated using two stage least squares instrumental variables.
Robust Standard Errors.
The coefficients of interest are multiplied by 100 for interpretation purposes.
The controls include: Proportion of formal workers, and proportion of people with a college education both in the initial year 2005.
* p<0.1, ** p<0.05, *** p<0.01

There is a negative and significant effect on low-skill informal workers' employment and a negative and significant effect on formal and informal medium-skill workers. These results suggest that the Chinese competition in foreign markets hurt wages for low-skill workers, but only for the informal ones, and also it reduced middle-skill employment, but with no effects on its wages. No significant effects on employment for low-skill formal workers nor high-skill workers are found.

To interpret the magnitude of the estimation using occupations as a different measure of skills, this research proceeds in the same way as with education, using the exposition indices' gap measure. In particular, if the Chinese competition exposure index increased from the level of the 25^{th} percentile to the level of the 75^{th} percentile: a) Hourly mean wage for informal low-skill workers would decrease by 9.56% and the mean hourly wage for high-skill formal workers would decrease in 7.46%, b) Monthly mean wage for low-skill informal workers would decrease in 8.67% with no effect on mean monthly wages for high-skill formal workers, c) Employment for low-skill informal workers would decrease in 31.55%, employment for medium-skill informal workers would decrease in 21.52%, employment for medium-skill formal workers would decrease in 26.38% and no significant effects on employment for high-skill workers.

These results are similar to the ones found using education as a measure of skills. The main difference is that now there is a negative and significant effect on employment for medium-skill workers.

For the effect of globalization exposure, no significant effects on wages are found. The results are similar to using education as a measure of skills as there is no effect on wages either. There is a negative and significant effect on low-skill informal employment and a negative effect on medium-skill informal employment, but no effect on employment for other workers.

Table 12: Globalization Exposure: Difference Log Hourly Wage Occupations

	(1) Informal Low-Skill	(2) Formal Low-Skill	(3) Informal Medium-Skill	(4) Formal Medium-Skill	(5) Informal High-Skill	(6) Formal High-Skill
Globalization	-0.00770	-0.00462	0.0436	0.0218	0.0458	-0.0608
Exposure	[-0.19]	[-0.12]	[0.82]	[0.48]	[0.59]	[-1.27]
Constant	-0.0392	0.00607	0.0652	-0.0398	-0.303	-0.0861
	[-0.28]	[0.04]	[0.60]	[-0.45]	[-1.09]	[-0.36]
Controls	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.002	0.019	0.008	.	0.093	0.043
Observations	56	55	56	55	56	56

t statistics in brackets
All regressions are estimated using two stage least squares instrumental variables.
Robust Standard Errors.
The coefficients of interest are multiplied by 100 for interpretation purposes.
The controls include: Proportion of formal workers, and proportion of people with a college education both in the initial year 2005.
* p<0.1, ** p<0.05, *** p<0.01

Table 13: Globalization Exposure: Difference Log Monthly Wage Occupations

	(1) Informal Low-Skill	(2) Formal Low-Skill	(3) Informal Medium-Skill	(4) Formal Medium-Skill	(5) Informal High-Skill	(6) Formal High-Skill
Globalization	-0.00376	-0.00701	0.0454	0.0117	0.0116	-0.0340
Exposure	[-0.10]	[-0.18]	[0.75]	[0.29]	[0.16]	[-0.65]
Constant	-0.0660	0.0443	0.0805	-0.0891	-0.334	0.0999
	[-0.44]	[0.33]	[0.53]	[-0.87]	[-1.49]	[0.34]
Controls	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.001	0.043	0.063	0.017	0.108	0.123
Observations	56	55	56	55	56	56

t statistics in brackets
All regressions are estimated using two stage least squares instrumental variables.
Robust Standard Errors.
The coefficients of interest are multiplied by 100 for interpretation purposes.
The controls include: Proportion of formal workers, and proportion of people with a college education both in the initial year 2005.
* p<0.1, ** p<0.05, *** p<0.01

In particular, if the globalization exposure index increased from the 25^{th} percentile to the 75^{th} percentile: Employment of low-skill informal workers would decrease by 38.9%, employment of medium-skill informal workers would decrease by 44.86% and no significant effect on employment for high-skill nor formal workers.

The results presented in this subsection serve as a robustness test for the main results. Using both measures of skills, it is found that Chinese import competition on foreign markets affected mostly the wages of the less skilled informal workers as expected because Chinese competition affected mostly industries intensive in unskilled labor. The surprising result is that it has a significant effect but just on informal workers. Informal firms do not export; nevertheless, these results can easily be rationalized in a simple Melitz (2003) model. As the informal firms are the firms with the lowest productivity Levy and Lopez-Calva (2016), an external shock makes the least productive firms exit the market; nonetheless, this did not happen, so informal firms have to adjust through other channels such as wages and employment. Also is essential to note that there are other measures of informality. Ulyssea (2018) distinguish two margins of informality, an extensive margin and an intensive margin in which formal firms can hire workers "off the

Table 14: Globalization Exposure: Difference Log Employment Occupations

	(1) Informal Low-Skill	(2) Formal Low-Skill	(3) Informal Medium-Skill	(4) Formal Medium-Skill	(5) Informal High-Skill	(6) Formal High-Skill
Globalization Exposure	-0.280**	-0.00822	-0.323**	-0.222	-0.152	-0.114
	[-2.37]	[-0.06]	[-2.65]	[-1.59]	[-1.53]	[-1.21]
Constant	-0.657	0.292	-0.738	-0.700	0.00354	0.0156
	[-1.45]	[0.50]	[-1.65]	[-1.19]	[0.01]	[0.05]
Controls	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.155	0.010	0.102	0.076	.	0.041
Observations	56	55	56	56	56	56

t statistics in brackets
All regressions are estimated using two stage least squares instrumental variables.
Robust Standard Errors.
The coefficients of interest are multiplied by 100 for interpretation purposes.
The controls include: Proportion of formal workers, and proportion of people with a college education both in the initial year 2005.
* p<0.1, ** p<0.05, *** p<0.01

books." This intensive margin can also explain why this research found an effect on informal workers, even though informal firms do not export.

The effects of Chinese competition on foreign markets and globalization exposure on wages after applying the hot-deck imputation are presented in the appendix. The results for globalization exposure on wages remains statistically insignificant. The results for Chinese import competition on foreign markets on wages are similar but differ in magnitude. The main difference is that using the hot-deck imputation, the positive effect of Chinese import competition on foreign markets is no longer statistically significant, and the coefficients are bigger in absolute value. In particular, using the corrected survey, this research found that if the Chinese competition exposure index increased from the level of the 25^{th} percentile to the level of the 75^{th} percentile : The mean hourly wage for non-college informal workers would decrease by 7.66% (6.74% in the not imputed survey), and the monthly mean wage for non-college informal workers would decrease by 7.01% (5.97% in not imputed survey).

8 Conclusion

This research analyzed the effects of two globalization measures; Chinese import competition on U.S. markets and increasing export opportunities from Mexico on Mexican local labor markets. China's rise as an important market-oriented economy with the economic reforms of 1978 and mainly since China's accession to the World Trade Organization in 2001 represented a threat to unskilled labor-intensive Mexican exports. Given its comparative advantages, Mexico specialized in unskilled-labor intensive export assembly processes within the North American production chain, but the industries and activities in which Mexico specialized overlapped with those where China also has substantial comparative advantages. The overlapping between activities in which both Mexico and China were specialized and China's enhanced presence in U.S. product markets harmed wages of less-skilled informal Mexican workers. Nevertheless, the other channel of increasing exports from Mexico, which was expected to have a positive sign, did not significantly affect wages. This unexpected result suggests that exposition to trade did not affect wages, so the current export-led development strategy did not improve Mexican workers' income.

The results presented in this work shed some light on understanding what happened with Mexico's wage structure during 2005-2018. The results suggest that globalization and especially Chinese competition on foreign markets had a

significant effect on Mexico's wage structure during this period, especially on wages for informal without a college education or low-skilled workers.

In sum, my results suggest that from 2005 to 2018, globalization resulted in a decrease in less-skilled workers' wages. This has important implications for Mexico's development strategy. Focusing on low-skill intensive exports seems to have a negative effect due to increased import competition from China. If Mexico wants to increase its population's wages, specializing in low-skill intensive exports in which China also has strong comparative advantages is not the solution.

A question that remains open for further research is to explain why high skill workers' wages are falling so sharply during this period. According to my results, globalization cannot explain this sharp decrease in skilled workers' wages, so other hypotheses have to be tested. Some potential explanations can be the low domestic credit to the private sector or the relatively poor education quality in Mexico. The lack of domestic credit to the private sector does not allow the creation of firms that requires substantial capital investments that is complementary to skills. The low quality of education in Mexico or the mismatch between education and firm requirements in a highly integrated global economy could explain why highly educated workers in Mexico are losing ground.

As G. H. Hanson (2010) mentions: "Even a cursory examination of Mexico's economic structure suggests the country is deep in the world of the second best, meaning that models based on a single distortion may be a poor guide to how future reform would change economic outcomes in the country." This means that to understand Mexico's development problems, it is necessary to understand how different distortions and policy interventions interact.

A Appendix

China Exposure

This appendix present the results of the estimation using the corrected survey using the hot-deck imputation.

Table A1: China Exposure: Difference Log Hourly Wage Imputed

	(1) Mean Wage	(2) Informal No College	(3) Informal College	(4) Formal No College	(5) Formal College	(6) Skill Premium Formal	(7) Skill Premium Informal
China Exposure	-0.0382	-0.0754**	-0.00453	-0.0115	0.00273	0.0142	0.0705
	[-1.30]	[-2.28]	[-0.08]	[-0.53]	[0.09]	[0.45]	[1.41]
Constant	0.0251	0.0272	-0.135	-0.0711	-0.247*	-0.175	-0.129
	[0.27]	[0.33]	[-1.04]	[-1.03]	[-1.84]	[-1.49]	[-0.72]
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.105	0.188	0.033	0.004	0.015	.	0.024
Observations	56	56	55	56	56	56	55

t statistics in brackets
All regressions are estimated using two stage least squares instrumental variables.
Robust Standard Errors.
Corrected ENOE survey using Hot-Deck imputation.
The coefficients of interest are multiplied by 100 for interpretation purposes.
The controls include: Proportion of formal workers, and proportion of people with a college education both in the initial year 2005.
* p<0.1, ** p<0.05, *** p<0.01

Table A2: China Exposure: Difference Log Monthly Wage Imputed

	(1) Mean Wage	(2) Informal No College	(3) Informal College	(4) Formal No College	(5) Formal College	(6) Skill Premium Formal	(7) Skill Premium Informal
China Exposure	-0.0289	-0.0691*	-0.000843	-0.0104	-0.00295	0.00741	0.0679
	[-0.98]	[-2.01]	[-0.01]	[-0.47]	[-0.09]	[0.21]	[1.32]
Constant	-0.00626	0.0222	-0.323***	-0.0433	-0.192	-0.148	-0.320*
	[-0.07]	[0.26]	[-2.69]	[-0.81]	[-1.12]	[-0.85]	[-2.00]
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.085	0.233	0.013	0.018	0.016	.	0.058
Observations	56	56	55	56	56	56	55

t statistics in brackets
All regressions are estimated using two stage least squares instrumental variables.
Robust Standard Errors.
Corrected ENOE survey using Hot-Deck imputation.
The coefficients of interest are multiplied by 100 for interpretation purposes.
The controls include: Proportion of formal workers, and proportion of people with a college education both in the initial year 2005.
* p<0.1, ** p<0.05, *** p<0.01

Globalization Exposure

Table A3: Globalization Exposure: Difference Log Hourly Wage Imputed

	(1) Mean Wage	(2) Informal No College	(3) Informal College	(4) Formal No College	(5) Formal College	(6) Skill Premium Formal	(7) Skill Premium Informal
Globalization	0.0194	0.00885	0.106	0.0131	0.0435	0.0304	0.00101
Exposure	[0.61]	[0.29]	[1.34]	[0.37]	[1.09]	[0.76]	[1.41]
Constant	0.0308	0.00863	-0.00475	-0.0620	-0.201	-0.139	0.0219
	[0.32]	[0.10]	[-0.03]	[-0.82]	[-1.42]	[-1.04]	[0.09]
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.094	0.130	.	0.004	0.024	0.016	.
Observations	56	56	55	56	56	56	55

t statistics in brackets
All regressions are estimated using two stage least squares instrumental variables.
Robust Standard Errors.
Corrected ENOE survey using Hot-Deck imputation.
The coefficients of interest are multiplied by 100 for interpretation purposes.
The controls include: Proportion of formal workers, and proportion of people with a college education both in the initial year 2005.
* p<0.1, ** p<0.05, *** p<0.01

Table A4: Globalization Exposure: Difference Log Monthly Wage Imputed

	(1) Mean Wage	(2) Informal No College	(3) Informal College	(4) Formal No College	(5) Formal College	(6) Skill Premium Formal	(7) Skill Premium Informal
Globalization	0.0255	0.0145	0.102	0.00285	0.0449	0.0420	0.000910
Exposure	[0.74]	[0.42]	[1.32]	[0.08]	[1.06]	[0.92]	[1.47]
Constant	0.00909	0.0117	-0.196	-0.0442	-0.147	-0.103	-0.184
	[0.10]	[0.13]	[-1.25]	[-0.75]	[-0.77]	[-0.52]	[-0.93]
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.078	0.195	.	0.019	0.030	0.023	0.050
Observations	56	56	55	56	56	56	55

t statistics in brackets
All regressions are estimated using two stage least squares instrumental variables.
Robust Standard Errors.
Corrected ENOE survey using Hot-Deck imputation.
The coefficients of interest are multiplied by 100 for interpretation purposes.
The controls include: Proportion of formal workers, and proportion of people with a college education both in the initial year 2005.
* p<0.1, ** p<0.05, *** p<0.01

I did the estimation for the corrected survey with skills and I did not found significant differences in the results.

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