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Undocumented Contributions: A Study of Mexican Immigrants in the United States Labor Force

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Abstract

As of 2019, the Migration Policy Institute estimated there were approximately 10.9 million Mexican immigrants living in the United States with 7.5 million of them participating in the U.S. labor force. With this many documented and undocumented Mexican immigrants contributing to U.S. labor, there is no doubt they play an important role and are key contributors in this country. This paper uses public data from the Integrated Public Use Microdata Series, specifically using information from the Current Population Survey (IPUMS CPS) from 1994 through 2019 to study behavior patterns of native workers, documented Mexican workers, and undocumented Mexican workers in the United States. Differentiating within the dataset who was a citizen, who was documented, and who was undocumented was a difficult task. An algorithm created by George Borjas was applied to the IPUMS dataset to achieve this. The results showed the highest employment rates and highest percentage in the labor force belonged to undocumented male Mexican immigrants followed by documented male Mexicans and then native males. The trend was the opposite for females. Results also showed those making the lowest wages for men as undocumented Mexican immigrants followed by documented Mexican immigrants and natives. This trend was the same for females with each group earning less than their male counterparts.

1. Introduction

In recent years, there has been increased debate in America about how the presence of Mexican immigrants has affected the U.S. economy as well as the labor market. This has been a topic of debate for decades however, recent President, Donald Trump, contributed greatly to the circulation of false and biased information on the topic with his claims of Mexico sending criminals over and immigrants migrating to take advantage of welfare opportunities[12]. This false information has contributed to both legal and illegal mal-treatment and discrimination of both documented and undocumented Mexican immigrants as well as American-born citizens and those "appearing" Mexican. This paper attempts to disprove prior accusations and rectify incorrect information by examining the contributions that Mexican immigrants bring to the U.S. through their participation in the labor force. This paper differs from previous literature as it focuses on current wage and employment comparisons concerning specifically documented and undocumented Mexican immigrants in the labor force.

2. Background

The U.S. Department of Labor Bureau of Labor Statistics found that in 2019, there were approximately 28.4 million foreign-born persons in the U.S. labor force. This was about 17.4% of the total U.S. labor force. It was also reported that Hispanics accounted for nearly half of the foreign-born labor force. Mexican immigrants have been contributing

to America's labor force, specifically agriculture and construction as far back as the early 1900s. Mexican migration rates more than doubled during the 1910s[15]. As much as Mexican immigrants have continuously contributed however, U.S. efforts to stop their migration have continuously persisted. The Immigration Act of 1990 and the Immigration Reform and Control Act of 1986 (IRCA) both authorized the US immigration and Naturalization Service to double the U.S. spending on border enforcement. The spending increased from $700 million in 1986 to $2.8 billion in 2002, to $10.1 billion in 2010. Total budgets for Customs/Border Protection and Immigration/Customs enforcement have increased every year from $9.2 billion in 2003 to $25.8 billion in 2020 through both President Bush and Obama[1]. More recently, President Trump put forth more efforts to decrease Mexican immigration. In January, 2019 under Trump's administration, the Department of Homeland Security announced the implementation of the "Remain in Mexico" program. The program allowed US border officers to send asylum seekers at the US-Mexico border back to dangerous parts of Mexico for months or even years while awaiting court proceedings. This included non-Mexicans who were seeking to cross at the Mexico border. Migrants have been seeking asylum in America due to the low availability of opportunities and high levels of danger in their origin countries. In 2019, the homicide rate in Mexico hit a new high as Mexico has been fighting an ongoing war against drug cartels[8]. Between January 25th and November of 2019 over 56,000 asylum seekers including 16,000 children were sent back to Mexico. Only 4% successfully made it to court and less than 1% were granted protection, with some later being returned to Mexico[10]. The "Remain in Mexico" program has also led to an increase in border camps for those seeking to cross the Mexico-American border. These camps have come under much scrutiny for being unsanitary and dangerous. The Trump administration reported the influx of asylum seekers (adults and children) a national security threat. Critics, including many in Congress, say the administration's response is exacerbating a humanitarian crisis in Central America, breaking U.S. laws, and violating international human rights norms[8]. These conditions have led to death in many cases for both adults and children. Obama's administration was also accused of prison-like, unsanitary detention facilities which violated due process and standards of care. Both administrations' migrant detention centers were reportedly in violation of the standards of care outlined in the 1997 Flores Settlement[8]. Mexican migrants are fleeing to America to build safer and better lives for themselves and their families by contributing to the labor force and in turn, the economy. However, they are repeatedly met with closed doors, imprisonment, and harm.

3. Literature Review

There is a lack of current research on undocumented immigrants in the United States labor force and an even more significant lack of current research on both documented and undocumented Mexican immigrants. Mexican immigrants make up the largest portion of immigrants to America. The Department of Homeland Security's estimates of the undocumented population approximated that, in 2015, about 55% of undocumented persons came from Mexico. Found in this dataset along with previous studies, the most popular states for undocumented persons to reside in are border states to Mexico, specifically California and Texas. In 2000, 42.1% of Mexican immigrants were living in California and 19.9% were living in Texas[5]. In 2014, 23% of undocumented immigrants lived in California and 15% lived in Texas[4]. By 2015, 24% of undocumented immigrants were living in California, and 16% were living in Texas[2]. California offers many agricultural and construction job opportunities and staying close to the border means less travel across an unfamiliar country. With many immigrants making the move to America at young ages and often leaving behind poor education in their origin countries, their educational attainments tend to be lower than that of native U.S. workers. Descriptive statistics on education in this paper support this trend. An estimation from 2014 showed that 39.5% of undocumented immigrants in America lack a high school diploma[4]. As of 2000, it was reported that 63% of Mexican male immigrant workers were high school dropouts compared to 8.7% of native males and 17% of non-Mexican male immigrants. In addition, 57% of female Mexican immigrant workers were high school dropouts compared to 6.5% of native female workers and 15.5% of non-Mexican immigrants[5]. In 2008, 61.5% of Mexican immigrants ages 25 and older had less than a high school degree, compared to 32.5% among all foreign-born adults. As well, 5.2% had obtained a bachelor's degree or higher, compared to 27.1% among all foreign born[15]. In Camarota's study from 1998, he estimated that 75% of immigrants in his dataset lacked a high school diploma[7]. Consistent with the results of this paper, those with low education levels often specialize in low-skilled occupations; occupations that are essential industries in America. These occupations include manual labor, cleaning, and the restaurant industry. Americans heavily rely on the goods and services these industries offer. A study from Durham, North Carolina on Hispanic immigrants reported that 88.5% of all men in the sample were working in construction, yardwork, or food preparation[9]. In 2000, 20.9% of Mexican immigrants and only 6.5% of native-born workers were employed in the subset of occupations classified as "food preparation and serving" or "buildings and grounds cleaning and

maintenance"[5]. Borjas and Katz noted that American consumers who spend more on low-skill domestic goods and services will in turn be benefitting from Mexican immigration. They also suggested that Mexican immigrants specializing in these low-skill occupations may serve to expand the supply and lower the U.S. prices of low-skill produced domestic goods and services. In the late 90's, a study of undocumented Mexican immigrants estimated that 93.2% of the male sample of Mexican undocumented immigrants were employed in blue-collar occupations along with 87.4% of the female sample[14]. Immigrant women have lower labor force participation than men. In 2009-2010, only 47% of Mexican immigrant women were employed. The main reason for this gender gap is that women were often taking care of households or family members[15]. It could be suggested that in many cases, undocumented immigrants may be preferable to employers over native workers. Borjas' study on the labor supply of undocumented immigrants found that by 2014, the employment rate of undocumented immigrants was 85%, legal immigrants was 81%, and natives was 74%[4]. This paper found similar trends to Borjas' findings of employment rates of immigrants. Controlling for age, Borjas found the employment gap between undocumented men and native men to be close to 30 percentage points for older men. He noted that this rise in employment for immigrants cannot be solely attributed to a decline in employment rate for natives, but there was in addition, an independent and rapid rise in employment for immigrant men. Calculating labor supply elasticity, Borjas' regressions yielded elasticities around 0.4 for native workers and around 0.04 for undocumented immigrants. With immigrants having such an inelastic supply curve it can be interpreted as immigrants' will to work not being affected by a slight change in wage, whether that is an increase or decrease. Native workers were found to be more concerned with what they were earning. Borjas' paper did not focus on specifically Mexican immigrants but with them making up roughly half of all immigrants, it is inferred that his results appropriately apply to them separately. With his results displaying higher employment rates and possibly higher willingness to work, Mexican immigrants still experience lower wages. For Mexican immigrants pre-1975, Bean, Lowell, and Taylor found that white males on average earn 27 percent more than pre-1975 Mexican immigrants and nearly twice as much as post-1975 Mexican immigrants[3]. In the 1990's, the wages of undocumented Mexican immigrants were significantly lower than those of documented immigrants. This gap holds for both men and women, with documented Mexican immigrant men receiving 41.8% higher earnings than undocumented, on average, and documented Mexican immigrant women receiving 40.8% higher wages than undocumented[14]. In 2000 there was estimated to be an approximate 41% wage gap relative to natives for Mexican immigrants, as compared to only a 3% wage gap for the non-Mexican immigrant population[5]. Massey and Gentsch's model suggests that undocumented Mexican migrants earn about 20% less, on average, than legal immigrants[13]. Wage gaps between documentation status and birthplace of immigrants are consistent with the results of this study. Much of the available literature, although varying by topic and population group, has yielded similar results to those of this paper.

4. Data Description

This paper uses the IPUMS CPS dataset from 1994 through 2019. The dataset contains approximately 1,943,979 native workers, 32,023 documented Mexican immigrants, and 29,736 undocumented Mexican immigrants. Although there is a large difference between the number of natives and Mexican immigrants, the dataset yields a similar representation of the make-up of America's whole population. Separating undocumented from documented immigrants using publicly available datasets has long been a challenging task in the immigration economics literature. To identify undocumented immigrants in my sample, an algorithm by George Borjas was used containing nine criteria. These criteria include; the person arrived before 1980, person is a citizen, person receives Social Security benefits, SSI, Medicaid, Medicare, or Military Insurance, person is a veteran or currently in the Armed Forces, person works in the government sector, person resides in public housing/receives rental subsidies or their spouse does, person was born in Cuba, person's occupation requires licensing, person's spouse is a legal immigrant or citizen. This algorithm identifies who is a citizen or documented person, leaving the rest of the persons in the dataset to be implied as undocumented. Applying this algorithm to clean the data was a difficult task but was necessary to provide the most accurate data possible. Birthplace was then controlled to identify those who were Mexican-born. The data is also differentiated between male and female. In the dataset, documented Mexican immigrants make up 18.6% of all documented immigrants and undocumented Mexican immigrants make up 38% of all undocumented immigrants. Mexican immigrants make up the largest group of immigrants in America in the dataset by 49,700 more persons than the next highest immigrant country, the Philippines.

5. Descriptive Statistics

Table 1. Various Descriptive Statistics

Category	**Native (Male)**	**Documented Mexican (Male)**	**Undocumented Mexican (Male)**	**Native (Female)**	**Documented Mexican (Female)**	**Undocumented Mexican (Female)**
In Labor Force	52.27% (.4994)	76.95% (.4211)	81.77% (.3861)	46.22% (.4986)	47.08% (.4991)	43.17% (.4953)
Employed	48.75% (.4998)	71.15% (.4530)	75.84% (.4280)	43.73% (.4960)	42.68% (.4946)	38.59% (.4868)
Unemployed	3.51% (.1841)	5.79% (.2336)	5.93% (.2362)	2.48% (.1556)	4.39% (.2050)	4.58% (.2090)
Age	34.5 (22.52)	40.71 (16.57)	30.36 (12.53)	36.47 (23.16)	41.17 (16.88)	31.42 (13.86)
Average Annual Income	$44,166 (54357.96)	$29,940 (36074.84)	$21,934 (26203.42)	$27,907 (33073.52)	$19,242 (20355.14)	$15,166 (21393.27)
Average Hourly Wage	$22.21 (635.31)	$14.31 (17.75)	$11.17 (17.09)	$16.29 (78.45)	$12.24 (50.50)	$10.15 (36.73)
Working Full Time	80.68% (.3948)	81.81% (.3857)	76.38% (.4247)	66.26% (.4728)	65.68% (.4748)	61.76% (.4860)

Both the documented and undocumented Mexican male immigrant population had higher portions in the labor force than native male workers. Following this, they had higher employment rates. As for females, the pattern is the opposite. Native women had the highest labor force participation and employment rates following by documented and undocumented female Mexican immigrants. Average age was lowest for both male and female undocumented Mexican immigrants. Many undocumented Mexican immigrants cross the border at very young ages to start working and to have access to opportunities not available in Mexico. The percentage working full time was lowest for undocumented male and female Mexican immigrants (76.38% and 61.76%). This could be explained by these groups working multiple part time jobs or working under the table. Undocumented Mexican immigrants also have a more limited pool of occupation options. Less women work full time across the board as they are more likely to be in charge of childcare and those in heterosexual couples often work less than their male counterparts.

Table 2. Education Level of Natives vs Mexican Immigrants

Highest Education Level	**Native (Male)**	**Documented Mexican (Male)**	**Undocumented Mexican (Male)**	**Native (Female)**	**Documented Mexican (Female)**	**Undocumented Mexican (Female)**
Bachelor's Degree	12.41%	4.31%	2.46%	12.76%	5.12%	2.75%
Some College	14.14%	8.30%	5.27%	15.43%	8.95%	5.39%
HS Diploma	23.39%	23.98%	22.87%	23.96%	23.31%	20.92%

or Equivalent						
Grade 9	2.48%	7.16%	10.75%	2.36%	7.65%	11.20%
Grade 5 or 6	0.41%	15.94%	17.46%	0.37%	15.68%	17.06%

The percentage of natives and Mexican immigrants with a high school diploma was very similar, all being between 24% and 20%. Native workers had a much higher percentage of those holding a bachelor's degree or attending some college. When it comes to only reaching low levels of education (grade school), Mexican immigrants had much higher percentages. Native workers often have easier access to higher education and higher quality education than those getting an education in Mexico. America also has stricter laws about keeping children in school until the age of 16. High percentages of Mexican citizens did not make it past grade 5 or 6. This being 15.84% for documented male Mexican immigrants, 17.46% for undocumented male Mexican immigrants, 15.68% for documented female Mexican immigrants, and 17.06% for undocumented female Mexican immigrants. For most education levels, Mexican female immigrants tended to have slightly higher percentages than their male counterparts. This may be due to their male counterparts leaving school earlier to work in manual labor jobs.

Table 3. Percentage of Natives vs Mexican Immigrants in Select Occupations 2010

Occupation 2010	**Native (Male)**	**Documented Mexican (Male)**	**Undocumented Mexican (Male)**	**Native (Female)**	**Documented Mexican (Female)**	**Undocumented Mexican (Female)**
Construction laborers	0.76%	4.25%	7.46%	0.04%	0.06%	0.13%
Chefs & Cooks	0.88%	3.41%	6.01%	0.64%	2.03%	3.42%
Ground Maintenance	0.53%	3.82%	6.19%	0.04%	0.14%	0.23%
Agricultural Workers	0.38%	4.01%	5.88%	0.10%	0.98%	1.72%
Janitors & Building Cleaners	1%	2.74%	2.75%	0.46%	2.23%	2.28%
Maids & Housekeepers	0.08%	0.44%	0.53%	0.61%	4.54%	7.11%

Mexican male immigrants tend to specialize in manual labor jobs with 7.46% of undocumented Mexican male immigrants working as construction laborers, 6.19% working ground maintenance, and 5.88% in the agricultural sector. 4.25% of documented male Mexican immigrants worked as construction laborers, 3.82% ground maintenance, and 4.01% agricultural. These numbers were all under 1% for native males. There were also high percentages of Mexican male immigrants working as chefs and cooks. Mexican female immigrants had lower percentages in manual labor jobs but much higher percentages as maids and housekeepers. Manual labor jobs tend to be male specialized while females tend to veer away from these. These specializations likely have something to do with the lower education levels of Mexican immigrants.

Table 4. States with Highest Percentages of Mexican Immigrants

Location	**Documented Mexican (Male)**	**Undocumented Mexican (Male)**	**Documented Mexican (Female)**	**Undocumented Mexican (Female)**
California	37.81%	27.47%	40.92%	28.91%
Texas	17.04%	15.88%	17.99%	18.0%

The states with the highest percentage of Mexican immigrants were California and Texas. Texas being a border state it is not surprising that this would be a favorable place for immigrants to reside. California is a border state as well but also has a surplus of agriculture and construction labor jobs available. Arizona and New Mexico, also border states, had much lower percentages of Mexican immigrants.

5.1. Figures

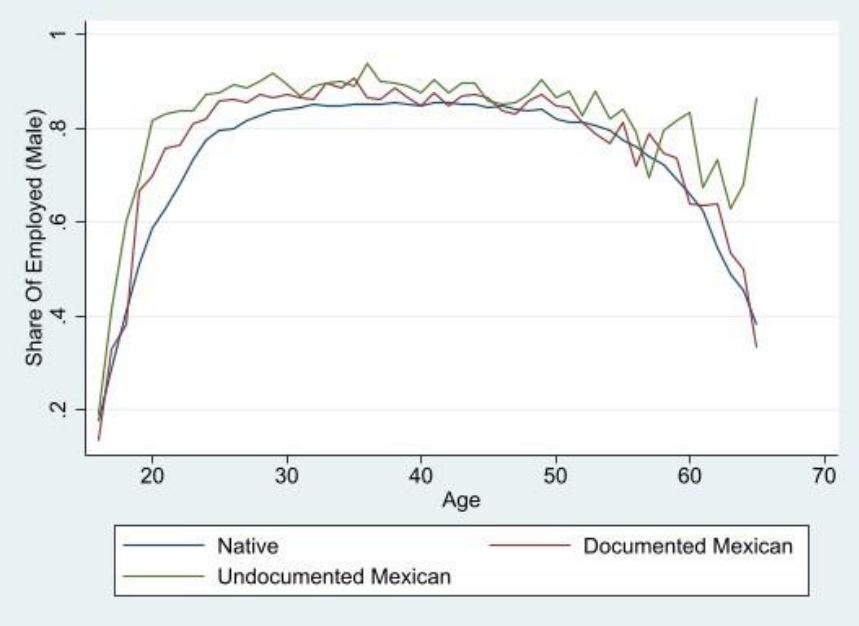

Figure 1: Age Profile of Male Workers' Employment Share

Figure 1: Males between the ages of 16 and 65. Data taken from 1994 through 2019. Overall, undocumented male Mexican immigrants had a higher employment rate than both native male workers and documented male Mexicans. Near retirement age, the employment rate for undocumented workers increased while native workers and documented workers started to leave the labor force.

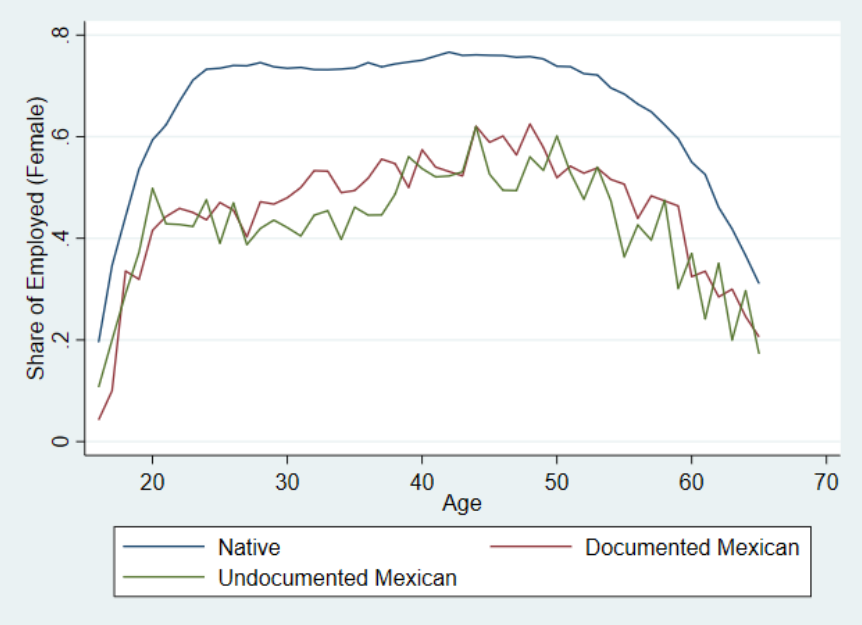

Figure 2: Age Profile of Female Workers' Employment Share

Figure 2: Females between the ages of 16 and 65. Data taken from 1994 through 2019. Native female workers consistently had higher employment rates than female Mexican immigrants. Near retirement age the employment rate of native female workers declined significantly and the employment rates of documented and undocumented female Mexican immigrants become closer together.

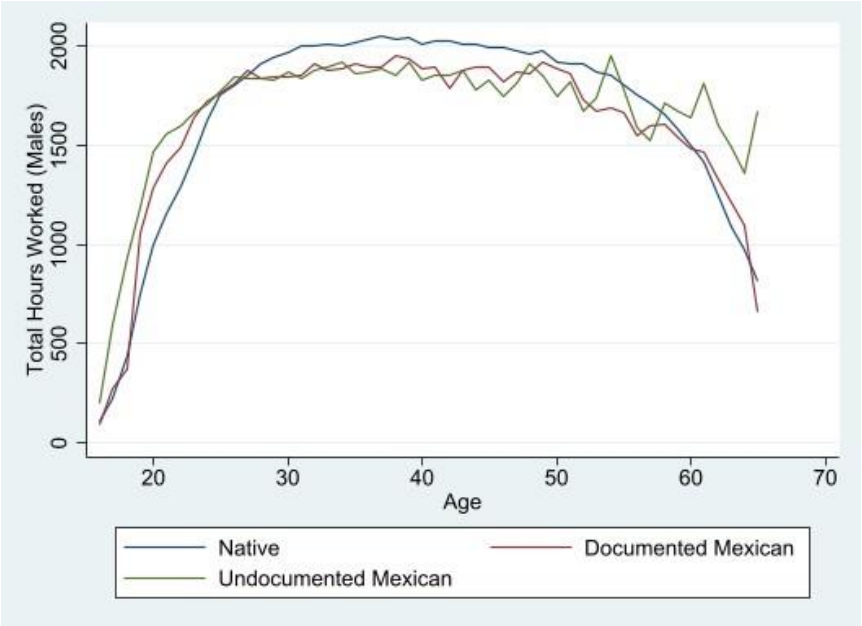

Figure 3: Age Profile of Male Workers' Total Hour Worked

Figure 3: Males between the ages of 16 and 65. Data taken from 1994 through 2019. As native workers and documented male Mexican workers neared retirement age, undocumented male Mexican immigrants worked longer into life and compensated for the native and documented workers making their way out of the labor force.

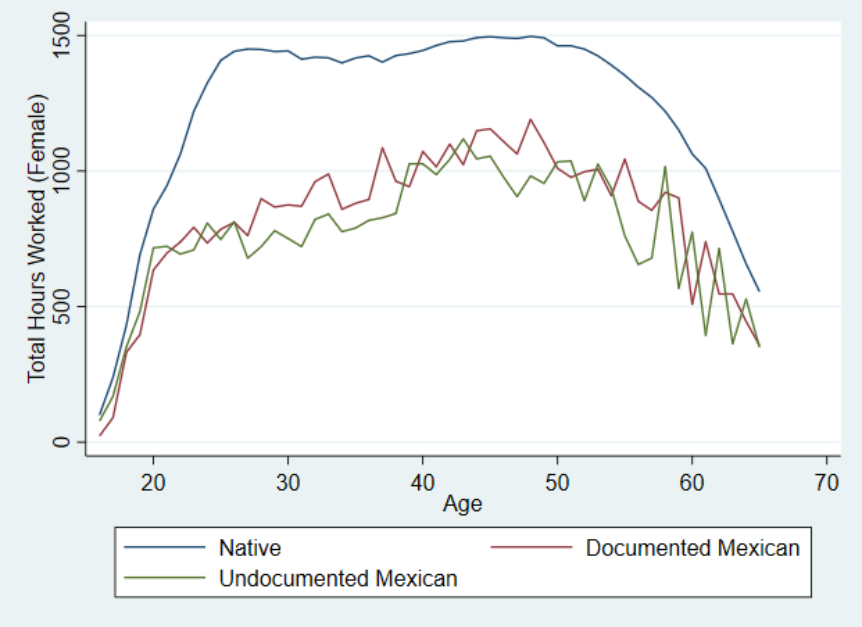

Figure 4: Age Profile of Female Workers' Total Hour Worked

Figure 4: Females between the ages of 16 and 65. Data taken from 1994 through 2019. Native female workers worked more hours through the entirety of their lifespan than Mexican female immigrants. Nearer retirement age, the total hours worked declined for all groups however the numbers become closer together.

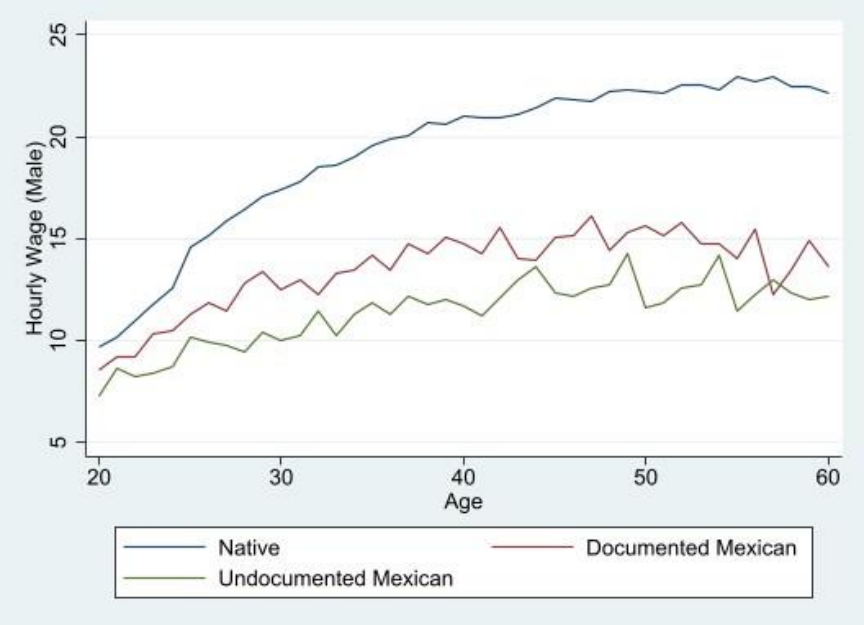

Figure 5. Age Profile of Male Workers' Average Hourly Wage

Figure 5: Males between the ages of 20 and 60. Data taken from 1994 through 2019. Native male workers consistently made a higher hourly wage than Mexican immigrants with undocumented immigrants making the lowest.

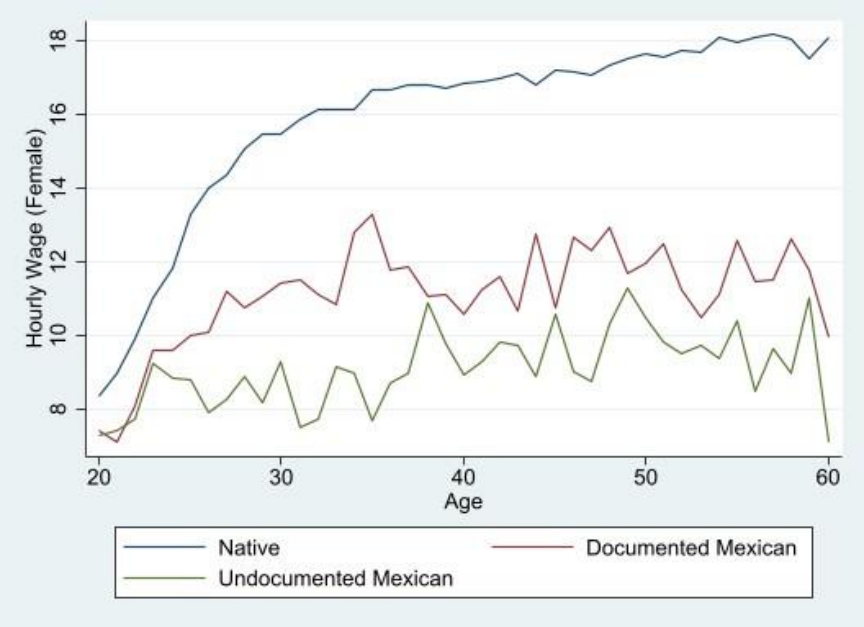

Figure 6. Age Profile of Female Workers' Average Hourly Wage

Figure 6: Females between the ages of 20 and 60. Data taken from 1994 through 2019. Native female workers consistently made a higher hourly wage than Mexican immigrants with undocumented Mexican immigrants making the lowest wage.

6. Empirical Strategy & Results

In this paper, four OLS regression equations were run for hourly wage, employment, total hours worked, and labor supply elasticity. Each regression was ran separately for male (if sex==1) and female (if sex==2), and includes a set of control variables.

Equation (1) $\text{hourlywage}_{it} = \beta_0 + \beta_1 I_{it}^{D} + \beta_2 I_{it}^{U} + \beta_3 (I_{it}^{D} * I_{it}^{Mex}) + \beta_4 (I_{it}^{U} * I_{it}^{Mex}) + \alpha_t + X_i\gamma + U_{it}$

Equation (1) measures the hourly wage of immigrants compared to native workers with native workers being the omitted variable.

Table 5. Variable Definitions

Variable	Definition
I_{it}^{D}	Indicator variable if individual i in calendar year t is a documented immigrant.
I_{it}^{U}	Indicator variable if individual i in calendar year t is an undocumented immigrant.
I_{it}^{Mex}	Indicator variable if individual i in calendar year t is a Mexican immigrant.
$(I_{it}^{D} * I_{it}^{Mex})$	Interaction variable of individual i in calendar year t being both a documented immigrant and Mexican immigrant.
$(I_{it}^{U} * I_{it}^{Mex})$	Interaction variable of individual i in calendar year t being both an undocumented immigrant and Mexican immigrant.
β_1	Measures the difference in hourly wages for documented immigrants after controlling for individual characteristics.
β_2	Measures the difference in hourly wage for undocumented immigrants after controlling for individual characteristics.
β_3	An interaction variable measuring the difference in hourly wage for documented Mexican immigrants after controlling for individual characteristics.
β_4	Interaction variable measuring the difference in hourly wage for undocumented Mexican immigrants after controlling for individual characteristics.
α_t	Year fixed effect.
$X_i\gamma$	Set of explanatory variables including education and sex.
U_{it}	Error term.

The results of equation (1) are listed in the table below.

Table 6. Comparison of Hourly Wage

	Male	**Female**
Documented Immigrant	-1.667 (0.517)	1.232** (0.016)
Undocumented Immigrant	-3.654 (0.417)	-1.624* (0.079)
Documented Mexican Immigrant	-1.418 (0.819)	-2.847** (0.024)
Undocumented Mexican Immigrant	-2.314 (0.735)	-0.729 (0.659)

Education	X	X
Year	X	X
Number of Observations	555,999	508,640

Equation (1) showed that documented male immigrants earned $1.67 less per hour than native male workers and undocumented male immigrants earned $3.65 less per hour. Documented female immigrants were found to have earned $1.23 more per hour than native female workers and undocumented female immigrants were found to have earned $1.62 less. For a documented immigrant from Mexico, the relative hourly wage is captured by $\beta_1 + \beta_3$. For undocumented Mexican immigrants the hourly wage is captured by $\beta_2 + \beta_4$. With this calculation, documented male Mexican immigrants earned $3 less per hour (documented male immigrant + documented male Mexican immigrant) than native male workers and undocumented male Mexican immigrants earned $5.5 (-3.654 - 2.314) less per hour. Results for males are not statistically significant. Documented female Mexican immigrants earned $1.62 less per hour (documented female immigrant + documented female Mexican immigrant) and undocumented female Mexican immigrants earned $2.35 less per hour. Education and year were controlled for both male and female groups. The results show that both male and female undocumented Mexican immigrants made the lowest hourly wage with undocumented male Mexicans earning the least overall in comparison to their native counterparts. Surprisingly, documented female immigrants were reported to earn more per hour than native workers. This might be driven by high skilled immigrant women from countries other than Mexico. This value is significant at the 95 percent level.

Equation (2) $\text{totalhour}_{it} = \beta_0 + \beta_1 I_{it}^D + \beta_2 I_{it}^U + \beta_3 (I_{it}^D * I_{it}^{Mex}) + \beta_4 (I_{it}^U * I_{it}^{Mex}) + \alpha_t + X_i\gamma + U_{it}$

Equation (2) measures the total number of hours worked per year by immigrants compared to native workers with native workers being the omitted variable. Equation (2) runs the same control variables as equation (1).

Table 7. Variable Definitions

β_1	Measures the difference in total hours worked for documented immigrants after controlling for individual characteristics.
β_2	Measures the difference in total hours worked for undocumented immigrants after controlling for individual characteristics.
β_3	An interaction variable measuring the difference in total hours worked for documented Mexican immigrants after controlling for individual characteristics.
β_4	Interaction variable measuring the difference in total hours worked for undocumented Mexican immigrants after controlling for individual characteristics.

The results of equation (2) are listed in the table below.

Table 8. Comparison of Total Hour Worked

	Male	**Female**
Documented Immigrant	37.285*** (0.000)	-33.445*** (0.000)
Undocumented Immigrant	163.181*** (0.000)	-8.709 (0.142)
Documented Mexican Immigrant	477.994*** (0.000)	145.1*** (0.000)
Undocumented Mexican Immigrant	457.854*** (0.000)	122.854*** (0.000)
Education	X	X
Year	X	X
Number of Observations	979,641	1,039,406

The results found that documented male immigrants worked 37 hours more per year than native male workers and undocumented male immigrants worked 163 hours more. For a documented immigrant from Mexico, the relative total hours worked per year is captured by $\beta_1 + \beta_3$. For undocumented Mexican immigrants the total hour is captured by $\beta_2 + \beta_4$. As for male Mexican immigrants, documented male Mexican immigrants worked 515 hours more per year (37.285 + 477.994) and undocumented male Mexican immigrants worked 621 hours more (163.181 + 457.854) than male native workers. For female immigrants, the results showed a negative trend with documented female immigrants working 33.4 hours less and undocumented female immigrants working 8.7 hours less. The trend went positive for female Mexican immigrants with documented female Mexican immigrants working 111.7 hours more per year than female native workers and undocumented female Mexican immigrants working 114.2 hours more. The results show that compared to natives and all immigrants, Mexican immigrants worked the most hours per year. For males, this was 500-600 hour difference and for females a less than 100 hour difference. This can reflect again that in most heterosexual households, the males are the breadwinners and females often times stay home with many having the responsibility to watch children. Education and year were controlled for both males and females. All results except female undocumented immigrants are significant at the 99 percent level.

Equation (3) $emp_{it} = \beta_0 + \beta_1 I_{it}^D + \beta_2 I_{it}^U + \beta_3 (I_{it}^D * I_{it}^{Mex}) + \beta_4 (I_{it}^U * I_{it}^{Mex}) + \alpha_t + X_i\gamma + U_{it}$

Equation (3) measures the likeliness to be employed compared to native workers with native workers being the omitted variable. Equation (3) runs the same control variables as equations (1) and (2).

Table 9. Variable Definitions

β_1	Measures the difference in likeliness to be employed for documented immigrants after controlling for individual characteristics.
β_2	Measures the difference in likeliness to be employed for undocumented immigrants after controlling for individual characteristics.

β_3	An interaction variable measuring the difference in likeliness to be employed for documented Mexican immigrants after controlling for individual characteristics.
β_4	Interaction variable measuring the difference in likeliness to be employed for undocumented Mexican immigrants after controlling for individual characteristics.

The results of equation (3) are listed in the table below.

Table 10. Likeliness To Be Employed

	Male	**Female**
Documented Immigrant	0.025*** (0.000)	-0.022*** (0.000)
Undocumented Immigrant	0.118*** (0.000)	-0.005* (0.065)
Documented Mexican Immigrant	0.213*** (0.000)	0.071*** (0.000)
Undocumented Mexican Immigrant	0.207*** (0.000)	0.069*** (0.000)
Education	X	X
Year	X	X
Number of Observations	1,064,648	1,129,733

The results show that documented male immigrants were 2.5% more likely to be employed than native male workers and undocumented male immigrants were 11.8% more likely to be employed. Female immigrants yielded negative results. Documented female immigrants were 2.25% less likely to be employed than native female workers and undocumented female immigrants were 0.5% less likely to be employed. For a documented immigrant from Mexico, the relative employment likelihood is captured by $\beta_1 + \beta_3$. For undocumented Mexican immigrants the employment likelihood is captured by $\beta_2 + \beta_4$. Following this, documented male Mexican immigrants were 23.8% more likely to be employed and undocumented male Mexican immigrants were 32.5% more likely to be employed than native male workers. Documented female Mexican immigrants were 4.8% more likely to be employed and undocumented female Mexican immigrants were 6.4% more likely to be employed than female native workers. Out of the three groups, Mexican immigrants were the most likely to be employed with undocumented male Mexican immigrants being the overall most likely. Education and year were controlled for both males and females. All results except female undocumented immigrants are significant at the 99 percent level.

Equation (4) $\log(\text{totalhour})_{it} = \beta_1 \log(\text{hourly-wage}) + \beta_2 \log(\text{hourly-wage}) * I_{it}^{D} + \beta_3 \log(\text{hourly-wage}) * I_{it}^{U} + \beta_4 \log(\text{hourly-wage}) * (I_{it}^{D} * I_{it}^{Mex}) + \beta_5 \log(\text{hourly-wage}) * (I_{it}^{U} * I_{it}^{Mex}) + U_i$

Equation (4) measures the labor supply elasticity of male and female native workers, documented immigrants, undocumented immigrants, documented Mexican immigrants, and undocumented Mexican immigrants.

Table 11. Variable Definitions

β_1	Measures the log of hourly wage of native workers after controlling for individual characteristics.
β_2	Measures the log of hourly wage of documented immigrants after controlling for individual characteristics.
β_3	Measures the log of hourly wage of undocumented immigrants after controlling for individual characteristics.
β_4	Interaction variable measuring the log of hourly wage for documented Mexican immigrants after controlling for individual characteristics.
β_5	Interaction variable measuring the log of hourly wage for undocumented Mexican immigrants after controlling for individual characteristics.

The results of equation (4) are listed in the table below.

Table 12. Labor Supply Elasticity

	Male	**Female**
Native	0.1436*** (0.000)	0.1377*** (0.000)
Documented Immigrant	0.0131*** (0.000)	0.0182*** (0.000)
Undocumented Immigrant	0.0065*** (0.002)	0.0145*** (0.000)
Documented Mexican Immigrant	0.0193*** (0.000)	-0.0093* (0.050)
Undocumented Mexican Immigrant	0.0287*** (0.000)	-0.0202*** (0.002)
Number of Observations	515,264	484,153

The results of equation (4) show that if wage increased by 1%, male native workers total hour worked would increase by 14.36% and female native workers total hour worked would increase by 13.78%. Since we are looking at the total effect for immigrants, for documented immigrants we add together $\beta_1 + \beta_2$ and for total undocumented immigrants, we add $\beta_1 + \beta_3$. If wage increased by 1%, documented male immigrants total hour worked would increase by 15.67% and undocumented male immigrants' total hour worked would increase by 15.01%. For Mexican immigrants, the elasticity is calculated by $\beta_1 + \beta_2 + \beta_4$ for documented and $\beta_1 + \beta_3 + \beta_5$ for undocumented. If wage increased by 1%, documented male Mexican immigrants total hour worked would increase by 17.6% and undocumented male Mexican immigrants' total hour worked would increase by 17.88%. Women had mostly lower labor supply elasticities than men. If wage increased by 1%, documented female immigrants would increase their total hours worked by 15.6% and undocumented female immigrants would increase their total hours worked by 15.23%. For female Mexican immigrants, negative labor supply elasticities were found. A 1% increase in wage meant a 14.67% increase in total hours worked by documented Mexican females and a 13.2% increase in total hours worked by undocumented Mexican females. All results except for documented female Mexican immigrants are significant at the 99% level. As for males,

the results show that native workers had the most inelastic labor supply curve and were the least responsive to changes in wage. Mexican male immigrants were the most responsive to changes in wage and had a more elastic labor supply with undocumented Mexican males being the overall most responsive. This demonstrates that with even a very slight increase in wage, male Mexican immigrants responded with the highest will to work. As for females, undocumented Mexican immigrants were the least responsive, followed by natives and then documented female Mexicans. This could be explained by women making up less of the labor force and oftentimes living in households with male breadwinners.

7. Conclusions

This paper used a data cleaning strategy and similar research model to Borjas' "The Labor Supply of Undocumented Immigrants" and yielded similar results for all sections of analysis. Although it was not an easy task, cleaning the data to identify undocumented immigrants was essential due to the important role they play in the labor force. Descriptive statistics showed that undocumented Mexican male immigrants had the highest percentage of their population in the labor force with the highest percentage employed and the lowest average age and income. Documented male Mexican immigrants as well had higher percentages in the labor force and employed than native workers. Female Mexican immigrants yielded lower percentages employed and in the labor force. Mexican immigrants were also found to have lower educational achievement than natives. Occupation statistics highlighted essential industries such as manual labor, cleaning, and restaurants as the most favorable industries for Mexican immigrants. Regression results showed that overall, Mexican immigrants were more likely to be employed than native workers (despite having lower education levels) and worked longer hours for lower pay. The total effect of their labor supply elasticity being the most elastic for Mexican males out of all groups shows they were the most sensitive to wage changes. Documented Mexican females yielded a more elastic labor supply curve than native female workers as well. There was a noticeable difference controlling for sex within the dataset but similar trends were found with the exception of negative regression results for female immigrants and female Mexican immigrants, most likely due to their lower labor force participation. Through descriptive statistics and regression, the large contributions by Mexican immigrants in the labor force, especially undocumented male Mexicans, are easy to see.

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