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Introduction: Evaluating Three Decades of the TN Program

This year marks the 30th anniversary of the Trade NAFTA (TN) classification program, which was established in 1994 under the North American Free Trade Agreement (NAFTA). The TN program offers a streamlined pathway for skilled professionals from Canada and Mexico to seek employment in the United States across a spectrum of qualifying occupations. Despite its three decades of existence, there is limited information available about the number and composition of TN professionals in the United States and their impact on the U.S. labor market.

The mobility of talented professionals across borders is often lauded as a key driver of global economic vitality. Indeed, supporters of the TN program emphasize its potential to facilitate cross-border partnerships, foster knowledge exchange, and boost innovation and economic growth within North America. However, like many immigration policies, the TN program faces several challenges and critiques, including concerns over wage suppression, displacement of native-born workers, and regulatory complexities. These issues underscore the need for a nuanced and data-driven assessment of the impacts of the TN program.

In comparison to alternative immigration pathways for skilled workers to enter the United States, the TN visa stands out in at least four regards: 1) there is no numerical limit on the number of TN workers; 2) there is no limit on the duration of work, as TN visas are issued in three-year increments and can be renewed indefinitely; 3) eligibility is restricted to individuals who meet specific education requirements, typically a bachelor's degree or higher, and who work in one of approximately 60 approved occupations; and 4) employers face lower application costs as they only need to provide letters confirming employment.

Against this backdrop, this paper aims to provide new data and insights on TN professionals over the past three decades. By combining traditional measures from available government statistics with new measurements based on microdata, this paper seeks to answer three key questions:

1. How has the volume and distribution of skilled TN professionals, across occupations and states, changed over time?
2. What types of workers – in terms of salary, age distribution, education level, and sex – are selected for the TN program?¹

3. Does the inflow of TN workers correlate with particular labor market outcomes for domestic workers?

In answering these critical questions, this paper provides a comprehensive analysis of TN workers in the U.S. labor market over the past 30 years.

Measuring TN Workers in the United States

Issues with Existing Data on TN Visa Issuances and Admissions

A significant challenge in understanding the role of TN workers in the U.S. labor market lies in accurately measuring their presence. Prior studies have provided insights into the TN program by analyzing publicly available government statistics.² Specifically, the available data on TN visas from the U.S. government track either visa issuances or admissions. However, these statistics do not allow for accurate counts of either the current number or inflow-outflow of TN workers in any given year. This complication arises due to the specific nature of how TN workers gain entry into the United States.

To qualify for TN status, individuals must meet several eligibility criteria, including: 1) being a Mexican or Canadian citizen, 2) having a prearranged full- or part-time employment offer with a U.S. employer, 3) working in a profession listed under the occupations approved for TN status, and 4) possessing the necessary qualifications to practice the indicated profession.

However, the TN program handles the entry of Mexican and Canadian foreign nationals differently. Mexican nationals are required to obtain a visa before entering the United States. After applying at a U.S. embassy or consulate abroad (typically in Mexico) and receiving visa approval, Mexican individuals may enter the United States after obtaining admission approval at designated Customs and Border Protection (CBP) ports of entry.

In contrast, Canadian nationals are generally not required to apply for TN visas prior to travelling to the United States. Instead, they may apply for TN status upon arrival at a CBP-designated port of entry. After approval by CBP officers, Canadian individuals are admitted under TN status. Since Canadian nationals do not require a visa authorizing travel to the United States, many are never issued a TN visa.

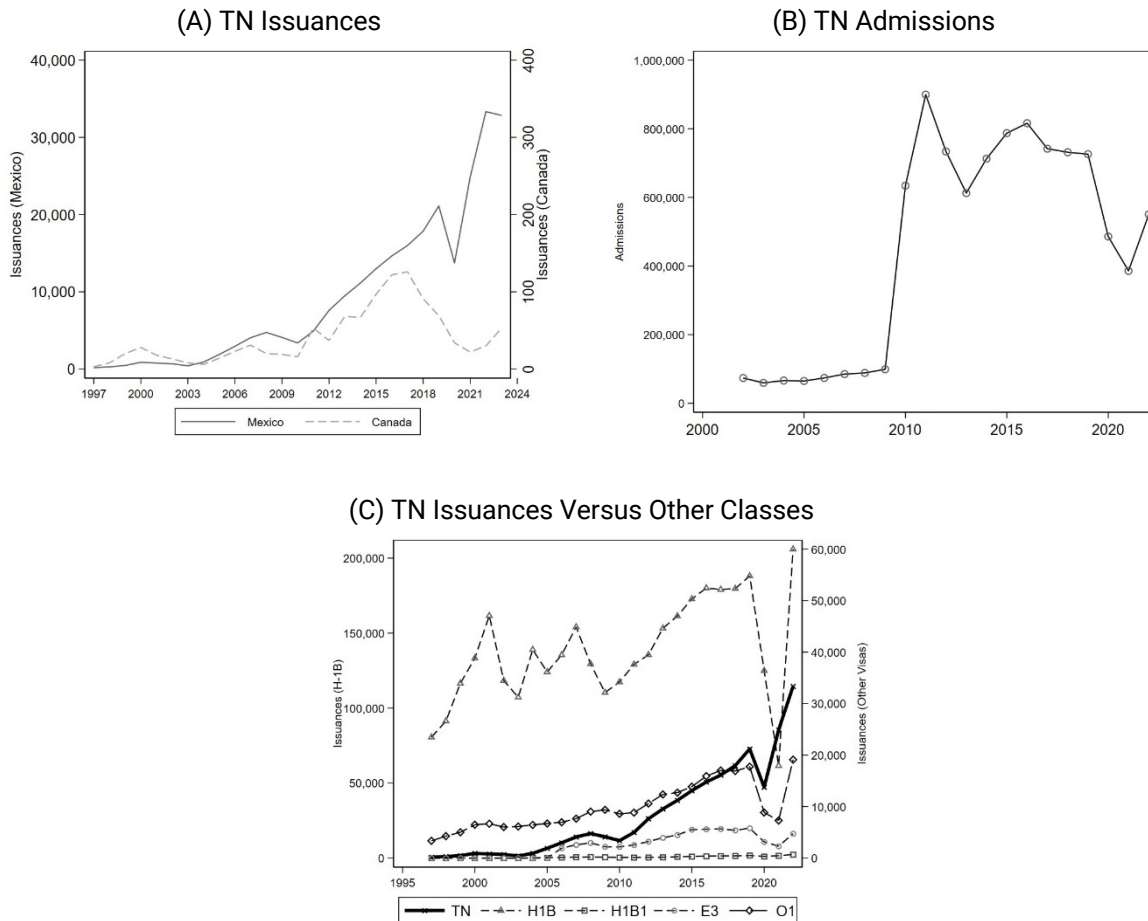
The U.S. State Department provides records of TN visa issuances, and the CBP offers data on TN admissions. However, these sources do not provide comprehensive or accurate measures of either the inbound-outbound flow or current number of TN workers in the United States. While visa issuances may accurately reflect the inflow of Mexican workers, they generally exclude most Canadian TN professionals. Moreover, the data on Mexican workers may be further complicated by the lack of distinction between new TN visa issuances and existing TN visas issued for those renewing or extending their visas.

TN Visa Issuances

Figure 1A illustrates the trends in TN visa issuances from the State Department.³ It reveals that the majority of these visas are issued to Mexican nationals (left vertical axis), while the number of visas issued to Canadian nationals is considerably lower (right vertical axis), rarely exceeding 100 per year.

Following the inception of the TN program, the number of TN visas issued to Mexican nationals was initially low. However, there were two periods of rapid growth. The first began in 2003, when visa issuances roughly doubled each year until the Great Recession halted growth in 2007. During this time period, the number of TN visas issued increased over tenfold, from only 415 in 2003 to 4,741 in 2007.

Figure 1 – TN Visa Issuances and Admissions, 1994–2022



Source: Data on visa issuances by fiscal year and class come from nonimmigrant visa statistics of the State Department. Admissions by class come from the Department of Homeland Security.

Note: Data on admissions changed in 2010 when reported data began to reflect all admissions rather than the first admission for a given individual. After the Great Recession, visa issuances to Mexican nationals accelerated again, rising from 3,376 in 2010 to 21,122 in 2019. In 2020, pandemic-related entry restrictions and other issues significantly reduced issuances, but the upward trend quickly resumed. By 2022, issuances had grown by 60% from 2019. Despite this, the most recent data point in 2023 shows that visa issuances have stagnated again. Whether this stagnation is temporary or indicative of long-term changes in the flow of Mexican TN workers into the United States remains to be seen.

TN Admissions

Figure 1B displays data from the CBP on TN admissions.⁴ Prior to 2010, admissions data generally reflected only the initial entries of individuals. However, beginning in 2010, both initial and subsequent entries of an individual were recorded. The lack of distinction between initial and subsequent entries, as well as between Canadian and Mexican nationals, makes much of the post-2010 data less useful for calculating the current number of TN professionals or their inflow-outflow.⁵ This is because multiple admissions of the same individual can be affected by various factors, such as exchange rates or travel costs, which may result in admissions increasing even if the actual number of TN workers is constant or shrinking.

Prior to 2010, however, a simple calculation could be performed to estimate the inflow of new Canadian TN professionals each year. The calculation requires two assumptions: 1) pre-2009 admissions data represent the new entry of unique TN professionals, and 2) visas issued to Mexican workers also represent the new entry of unique TN professionals from Mexico. Under these assumptions, the number of new Canadian TN professionals can be estimated by subtracting the number of TN visa issuances to Mexico from the total number of TN admissions.

These calculations are presented in Table 1, with the “Residual” column reflecting potential inflows of Canadian TN professionals. The figures suggest that prior to 2009, the majority of TN professionals were from Canada, while Mexicans comprised only about 4%–5% of TN professionals by 2008–09.

Table 1 – Approximating Canadian TN Professionals Prior to 2010

Year	TN Admissions	TN Issuances to Mexico	Residual (Admissions – Issuances to Mexico)
2009	99,018	4,105	94,913
2008	88,382	4,741	83,641
2007	85,142	4,060	81,082
2006	73,880	2,949	70,931
2005	65,010	1,888	63,122

2004	66,219	902	65,317
2003	59,446	415	59,031
2002	73,699	686	73,013

Source: Data on TN issuances come from the U.S. State Department.⁶ Data on TN admissions come from the Office of Homeland Security Statistics.⁷ Residual was calculated by the author.

Note: Table includes figures on TN visa admissions and issuances prior to 2010. In 2010, visa admissions data began counting every instance of an individual’s entry into the country. Therefore, pre-2010 data are more likely to reflect unique individuals.

Comparing the TN Program to Similar Visa Classes

How does the TN program compare with other related visa programs for skilled workers? Figure 1C illustrates visa issuances for various skilled immigrant visa categories alongside the TN program. These other visa categories include the H-1B, H-1B1, E-3, and O-1 visas. Among them, the H-1B remains the primary pathway for skilled immigrants to work in the United States. The H-1B program is subject to an annual cap of 85,000 for individuals seeking employment at private for-profit companies, while those working in nonprofit organizations are exempt from this quota.

The H-1B1 visa (for nationals of Chile and Singapore) and the E-3 visa (for nationals of Australia) are similar to the TN visa in that they were negotiated through trade agreements and have country-specific restrictions. However, unlike the TN visa, the H-1B1 and E-3 visas are subject to numerical quotas. The H-1B1 quota is set at 6,800 per year, with 1,400 allocated to Chileans and 5,400 to Singaporeans. The E-3 visa is capped at 10,500 per year and is exclusively for Australian nationals.

In terms of qualifications, these alternative visa classes generally require a bachelor’s degree or higher but are less rigid regarding occupation. The H-1B, H-1B1, and E-3 visas require that individuals work in a “specialty occupation,” defined as a role that requires theoretical and practical application of a body of specialized knowledge, along with a bachelor’s degree or the equivalent in a specific field. In practice, many of these visas are awarded to individuals working in science, technology, engineering, and mathematics (STEM) fields.

Also included in the comparison are O-1 visas, which are granted to individuals of extraordinary ability. Eligibility requires that individuals have national or international recognition or acclaim for contributions to the sciences, arts, education, business, or athletics. While qualifications may vary, they often require at least a bachelor’s degree.

Figure 1C shows that the H-1B visa program (left vertical axis) is significantly larger than all other visa classes (right vertical axis). Currently, around 200,000 H-1B visas are issued annually. Despite its smaller size, the TN visa program has grown to lead all other visa classes, with about 35,000 visas issued each year. Considering that TN visa

issuances typically reflect only the entry of Mexican workers, the actual total number of TN visas issued is likely much higher – possibly double (or more than double) the current figure. Thus, the TN program could be anywhere from 17.5% (35,000 TN visas / 200,000 H-1B visas) to 35% (70,000 TN visas / 200,000 H-1B visas) of the size of the H-1B program, assuming that the number of new Canadian TN workers is the same as Mexican TN visa issuances.

An important consideration when comparing visa categories for skilled immigrants is that these programs are not entirely independent. Economic and policy-related factors that affect the ease of obtaining one visa may influence applications for other visa classes. For example, other recent studies show that visa issuances for TN, H-1B1, and E-3 visas increase when the H-1B quota becomes more restrictive, indicating that U.S. employers may view these visa classes as somewhat substitutable.⁸ The interconnectedness of these programs is an important consideration in understanding the optimal design of the TN program.

Developing a New Methodology to Measure the TN Workforce

Given the limitations of government-provided statistics in accurately measuring the current number or inflow-outflow of TN workers, this paper develops a new measurement of the TN workforce using U.S. census data. Measures of the likely-TN workforce in the United States are created using a 5% sample from the 1990 and 2000 U.S. censuses and a 1% sample of the American Community Surveys (ACS) from 2001–22.⁹ The Integrated Public Use Microdata Series (IPUMS), a collection of publicly available, individual-level census data, was also used.

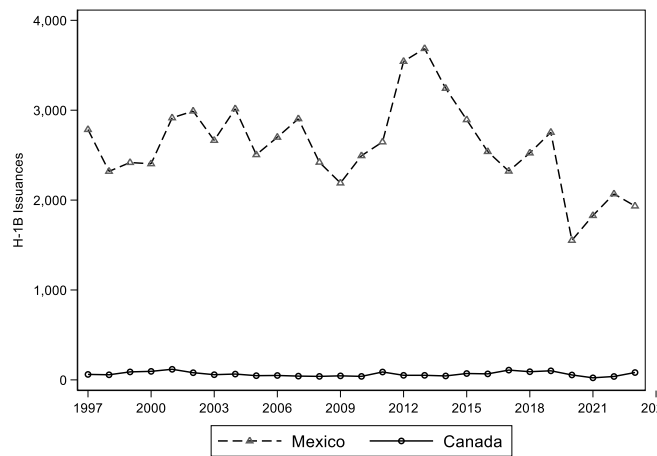
TN workers were identified in IPUMS microdata of the U.S. census and ACS by using the program eligibility criteria that places restrictions on 1) occupations, 2) qualifications, and 3) country of citizenship. TN workers may only seek employment under a list of approved occupations (Table A.1). Thus, the first step involved identifying TN-eligible occupations in the IPUMS microdata. Occupations in the approved list (Table A.1) were matched with available occupation classifications provided by IPUMS.¹⁰ Specifically, occupation titles from Appendix Table 1 were manually matched to occupation titles under the “OCC1990” variable available in IPUMS microdata.¹¹ OCC1990 is a time-consistent occupational classification that reflects coding schemes in 1990. Using the 1990 coding schemes avoids any potential impacts that inflows of TN workers may have had on changes to later occupational classifications.

TN eligibility requirements also stipulate that individuals must possess the necessary qualifications for their occupation (as shown in column 2 of Table A.1). All eligible occupations require either a bachelor’s degree or other occupation-specific licenses or credentials. Because information on licensure/credentials is limited, educational attainment is used as a proxy. The IPUMS microdata provide information on the highest degree earned, and individuals with a bachelor’s degree or higher are considered to have satisfied the qualification criterion for TN eligibility.

Finally, the TN program is only available to citizens of Mexico or Canada who are not U.S. citizens. Although IPUMS data do not contain information on country of citizenship for foreign nationals, they do include information on country of birth. Additionally, IPUMS data indicate whether individuals are U.S. citizens, permanent residents, or noncitizens. Therefore, the country eligibility criterion is considered satisfied for non-U.S. citizens born in Mexico or Canada.

The intersection of these three criteria – individuals working in TN-eligible occupations, possessing a bachelor’s degree or higher, and being born in Mexico or Canada but not being U.S. citizens – illustrates how TN workers are identified in IPUMS microdata. Some errors invariably occur with this method, as some individuals meeting these three criteria may not actually be TN professionals. For example, H-1B workers or undocumented immigrants could also potentially satisfy these criteria. However, this error is likely minimal. Very few H-1B visas are awarded to Canadian and Mexicans each year (Figure 2), and undocumented migrants tend to have lower educational attainment on average. Their status may also preclude them from obtaining the necessary qualifications or licenses for many TN-eligible occupations.¹²

Figure 2 – H-1B Visa Issuances to Canadian and Mexican Nationals



Source: H-1B Visas issued by nationality and fiscal year come from the State Department’s nonimmigrant visa statistics.

Uncovering New Data and Trends on TN Workers

This section describes a newly developed measurement of TN professionals in U.S. census and ACS data to conduct a descriptive analysis of trends in the TN workforce over time. It then assesses the distribution of TN workers across various TN-eligible occupations and their geographic distribution across states. Finally, it explores their

current demographic characteristics, including age, sex, education, and wage/income levels.

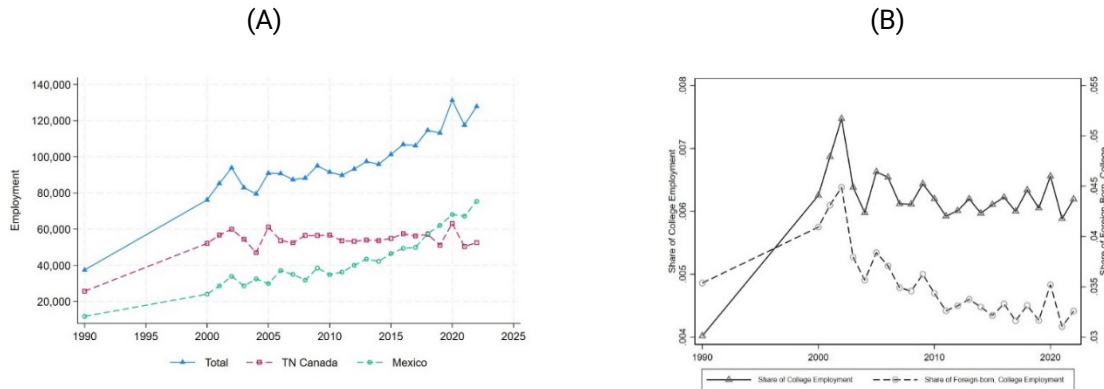
The identification of TN workers in census and ACS data allows for an analysis of the number of TN professionals in the United States over time. Figure 3A illustrates trends in TN employment in 1990, 2000, and each year from 2001 to 2022. Several key insights emerge from the data. First, prior to the inception of the TN program in 1994, the United States already had a modest number of Canadian and Mexican skilled immigrant workers in TN-eligible occupations – approximately 11,000 Mexicans and 25,000 Canadians – likely working under preexisting work permits. The introduction of the TN program appears to have contributed to an increase in these workers, with the total number of TN workers exceeding 76,000 by 2000.

In the early years of the TN program, the majority of TN professionals (around two-thirds) were from Canada. However, Canadian TN employment has remained relatively stable over time, usually totaling just over 50,000 workers. In contrast, Mexican TN employment has grown significantly over time, with annual growth rates averaging around 6% per year. By 2018, Mexican TN professionals surpassed their Canadian counterparts in number for the first time. Despite the more challenging entry process, Mexican TN employment has continued its upward climb in recent years. Where Canadian TN workers once accounted for over two-thirds of all TN professionals, Mexican TN workers now constitute almost two-thirds of the total TN workforce.

Figure 3B depicts the share of TN workers within the broader labor market of college-educated employees in TN-eligible occupations. Overall, TN workers represent a relatively small proportion of these labor markets. Currently, TN workers account for slightly more than 0.6% of all college-educated employees working in TN-eligible occupations. The introduction of the TN visa did increase the presence of skilled Canadian and Mexican workers in these occupations, from 0.4% in 1990 to a high of 0.75% in 2002. Despite the strong overall growth in employment, the share of TN workers has remained relatively constant at around 0.6% over the past decade.

Additionally, the proportion of TN workers among all foreign-born, college-educated employees in TN-eligible occupations has fallen slightly over the past decade, from a peak of 4.5% in 2002 to 3.25% in 2022. This indicates stronger growth in the number of foreign-born, college-educated professionals entering through alternative means, including skilled immigrant programs such as the H-1B, H-1B1, and E-3 visas. A range of factors may contribute to this pattern, including evolving labor market conditions in Mexico and Canada, changes in the relative ease of entry for individuals with TN and other visa classes, and differences in the skills available and in demand for Canada, Mexico, and other countries.

Figure 3 – Estimates of TN Employment, Levels and Shares, 1990–2022



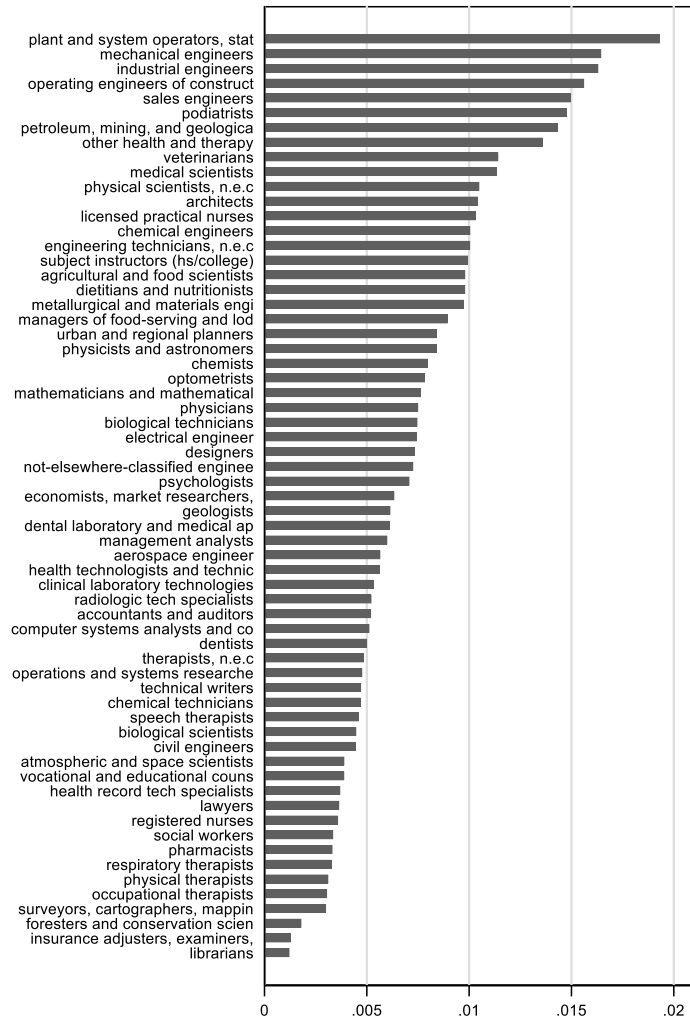
Source: Data show estimates of TN employment from U.S. census and American Community Survey data from IPUMS.

Note: The TN estimates are likely overestimated due to other possible non-TN immigrants who could satisfy the ACS’s occupation, education, and country-of-origin criteria. In this case, it’s most likely that they would be H-1B visa holders and/or undocumented immigrants.

Figure 4 illustrates the share of TN professionals within the college-educated workforce across various TN-eligible occupations in 2022. Notably, TN professionals have a larger presence in many STEM-related occupations. For example, they represent more than 1.5% of the college-educated workforce in occupations such as plant and systems operators, stationary engineers, mechanical engineers, industrial engineers, operating engineers in construction, and sales engineers. In contrast, they represent a much smaller share of health and medical-related occupations, such as pharmacists, physical therapists, occupational therapists, and registered nurses. This indicates that TN professionals are more prevalent in technical STEM fields that demand specific skills, compared to other fields like health, medicine, and law, where additional U.S.-specific licensure requirements may pose barriers to entry.

How has the presence of TN professionals in various occupations changed over time? Figure 5 provides a scatterplot that compares the TN share within college-educated employment across different TN-eligible occupations between 2000 and 2022. The vertical axis represents the TN share in 2022, while the horizontal axis represents the share in 2000. The red 45-degree line provides a visual reference, indicating whether the presence of TN professionals in an occupation has increased (above the line) or decreased (below the line) over this period. Points that fall exactly on the line represent occupations where the TN share has not changed over the roughly two decades between 2000 and 2022.

Figure 4 – Share in College Employment, by Occupation 2022

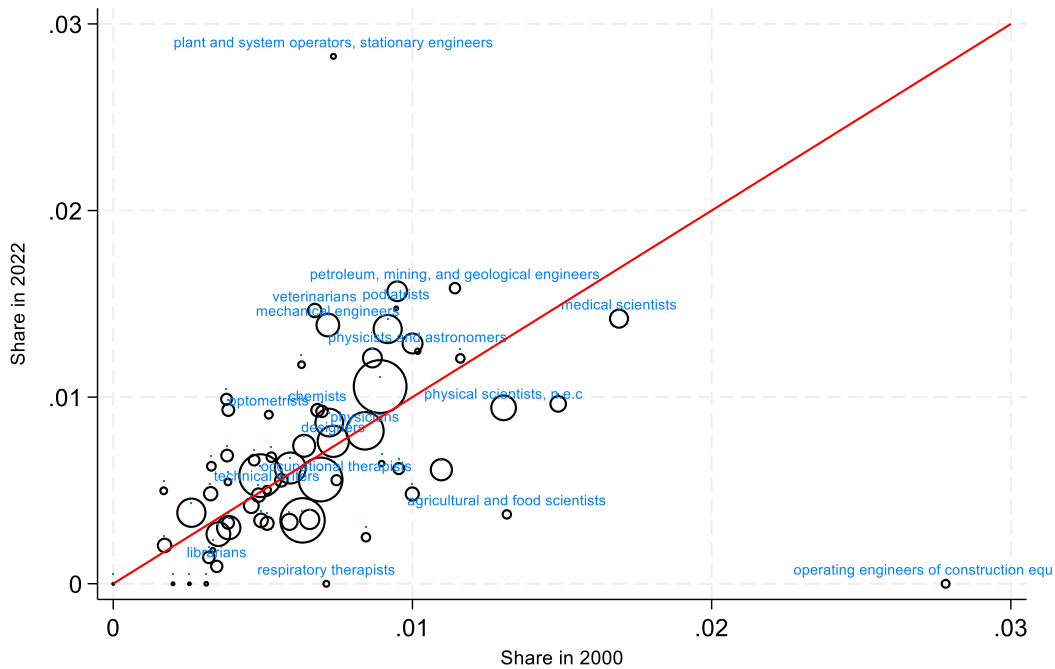


Source: Data from IPUMS ACS 2022 1% sample.

Note: Figure shows the share of TN professionals in total college-educated employment for each TN-eligible occupation.

Interestingly, several of the top occupations in Figure 4 have expanded their TN presence over time, as shown in Figure 5. For example, TN professionals working as plant and system operators or stationary engineers saw their share increase from 1% in 2000 to nearly 3% of the skilled workforce in 2022. In contrast, many occupations with lower TN shares in Figure 4 had higher representation in 2000 but saw a decline over time. A comprehensive list of TN-eligible occupations and their TN shares in college-educated employment for the years 1990, 2000, 2010, and 2022 is provided in Appendix Table A.3 for reference.

Figure 5 – Share in College Employment by Occupation – 2000 Versus 2022



Source: Data for 2022 comes from the 2022 ACS 1% sample, while data for 2000 comes from the 2000 census 5% sample.

Note: Scatterplot shows the TN share in college-educated employment for each TN-eligible occupation measured in 2022 against its measure in 2000. Labels are only displayed for select occupations for visual clarity.

The changing presence of TN professionals across various occupations could be a result of a variety of factors. For example, changes in licensing requirements may have made it more challenging to enter certain legal and health-related occupations, possibly leading to their declining TN representation over time. Alternatively, increasing demand for skilled professionals in technical STEM fields may have contributed to the rise of TN professionals in those areas. Additionally, changes in alternative immigration policies could have influenced these trends. For example, the introduction of the H-1C visa in 1999, aimed at addressing the shortage of registered nurses in the United States, may have led employers to opt for H-1C-eligible professionals instead of TN professionals. Finally, evolving economic conditions in Canada and Mexico may have affected the availability of skilled labor from these countries. Future research is needed to rigorously analyze these trends and provide greater insight into the underlying factors.

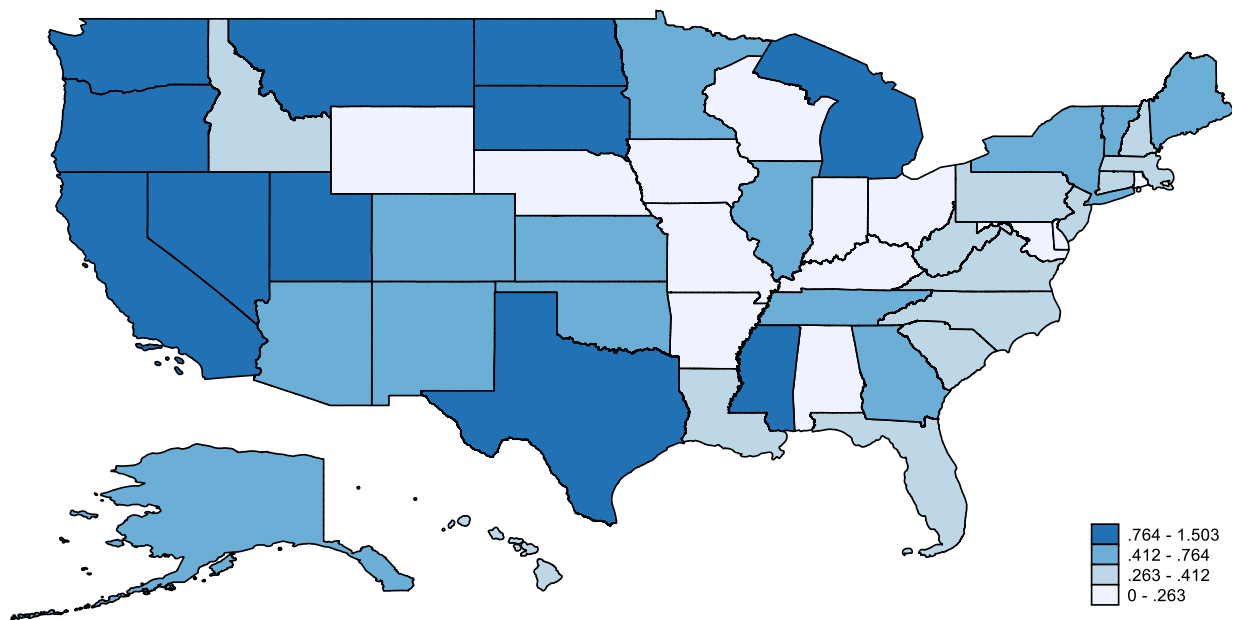
Geographic Distribution

Another important dimension to consider is the geographic distribution of TN professionals across the United States. Figure 6 displays the proportion of TN

professionals within the college-educated workforce in TN-eligible occupations by state. The shading reflects four categories, with darker shading indicating a higher percentage of TN workers.

While TN professionals make up approximately 0.6% of the college-educated workforce in TN-eligible occupations, there is significant variation across states. Unsurprisingly, TN professionals have a higher presence in states with traditionally large immigrant populations, such as California (foreign-born share of 26.7%), Texas (foreign-born share of 17.2%), and Nevada (foreign-born share of 18.9%). Interestingly, however, there are several states with a relatively high presence of TN professionals that typically do not have large immigrant populations.¹³ These include states such as Montana (foreign-born share of 2.3%), North Dakota (foreign-born share of 4.9%), South Dakota (foreign-born share of 3.5%), and Mississippi (foreign-born share of 2.2%).

Figure 6 – Distribution of TN Professionals Across States, 2022



Source: Data taken from the 2022 ACS 1% sample.

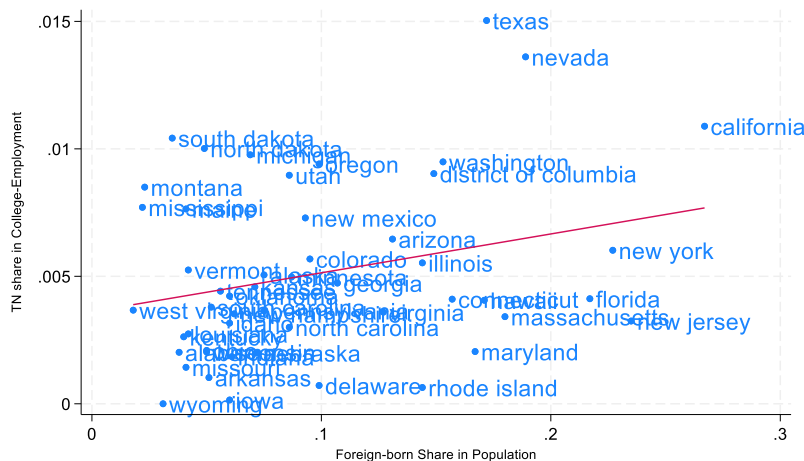
Note: The map is shaded according to the share of TN professionals in college-educated employment in TN-occupations. Thresholds are listed in percentage terms; for example, the lightest shading reflects shares between 0% and 0.263%.

Figure 7 presents a scatterplot depicting the relationship between the TN share and the overall foreign-born share of the population across states. The scatterplot reveals a positive, though relatively weak, association (correlation of 0.273) between the TN share and the overall foreign-born share within states. Several states, such as New York, New Jersey, and Florida, exhibit high foreign-born populations shares but lower TN

shares, whereas other states show the opposite pattern, with high TN shares but lower overall foreign-born population shares.

Taken together, these findings suggest that while the TN program tends to allocate workers to geographic areas that already have sizable immigrant populations, it also effectively directs skilled labor to areas with very little immigrant presence. Consequently, the program appears to address shortages of skilled workers in regions that typically lack a robust immigrant population.

Figure 7 – Correlation Between TN Share and Overall Foreign-Born Share, 2022

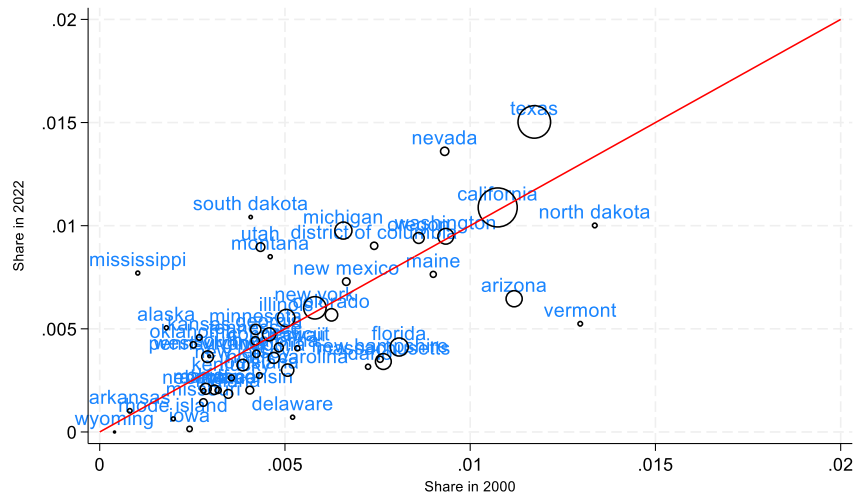


Source: TN share calculated from the 2022 ACS 1% sample, as a share of TN professionals in college-educated employment of TN-eligible occupations, by state. Data on overall foreign-born share in population by state comes from an American Community Survey Brief.¹⁴

Finally, it is worth examining how the geographic distribution across states has evolved over time. Figure 8 depicts a scatterplot, similar to Figure 5, that shows the TN share in college employment for TN-eligible occupations for each state in 2022 (vertical axis) compared to 2000 (horizontal axis). The red 45-degree line indicates states where the presence of TN professionals has either increased (above the line) or decreased (below the line). States lying exactly on the line have seen no change in TN share from 2000 to 2022.

Since 2000, many states have seen increases in TN presence, including Texas, Nevada, Utah, and Mississippi. Conversely, many other states, such as North Dakota, Vermont, Arizona, Florida, Iowa, Rhode Island, and Delaware, have experienced reductions in TN share. A few states, such as California, Washington, and New York, have remained relatively constant over the past two decades. Various state-specific factors may account for some or all of these trends. For further details, refer to Appendix Table A.4, which lists TN shares by state for 1990, 2000, 2010, and 2022.

Figure 8 – Share in College Employment by State (2000 Versus 2022)



Source: Data for 2022 comes from the 2022 ACS 1% sample, while data for 2020 comes from the 2000 census 5% sample.

Note: Scatterplot shows TN shares in 2022 against those in 2000.

Current Demographic Characteristics and Wage/Income of TN Workers

This section examines the characteristics of TN workers currently employed in the United States, focusing on age, sex, educational attainment, wages, and total income. The statistics were calculated by pooling the 1% samples of the American Community Surveys for 2021 and 2022. The sample only includes college-educated, working-age (ages 21–65) individuals in TN-eligible occupations who reported positive wage income. All monetary values are expressed in constant 2022 dollars.

Table 2 provides summary statistics for five distinct groups: 1) all TN professionals, 2) Mexican TN professionals, 3) Canadian TN professionals, 4) native-born college-educated workers in TN-eligible occupations, and 5) non-TN foreign-born college-educated workers in TN-eligible occupations. The findings for these groups are discussed in the following subsections. The final two rows of Table 2 display the counts of individuals, adjusted using census person weights (weighted N), and the underlying sample size of individual survey respondents.

Table 2 – Descriptive Statistics of TN Professionals, 2021–22

Variable	TN Professionals	TN Professionals From Mexico	TN Professionals From Canada	Skilled Natives in TN Occupations	Skilled Immigrants in TN Occupations
Age	38.52 (10.19)	36.86 (9.31)	40.81 (10.89)	40.83 (11.96)	42.44 (10.92)
Male	0.55 (0.50)	0.58 (0.49)	0.51 (0.50)	0.45 (0.50)	0.50 (0.50)
Female	0.45 (0.50)	0.42 (0.49)	0.49 (0.50)	0.55 (0.50)	0.50 (0.50)
Bachelor's Degree	0.52 (0.50)	0.65 (0.48)	0.33 (0.47)	0.54 (0.50)	0.43 (0.50)
Master's/Prof. Degree	0.36 (0.48)	0.29 (0.45)	0.47 (0.50)	0.38 (0.49)	0.42 (0.49)
Doctorate Degree	0.12 (0.32)	0.06 (0.23)	0.21 (0.40)	0.08 (0.26)	0.15 (0.35)
Weeks Worked	47.35 (10.38)	47.05 (10.68)	47.78 (9.94)	48.00 (9.34)	48.11 (9.34)
Total Wage Income	99,813 (105,139)	77,090 (75,592)	131,350 (129,439)	99,797 (98,393)	112,786 (106,733)
Weekly Wage	2,120 (2,414)	1,623 (1,526)	2,810 (3,141)	2,115 (2,453)	2,364 (2,485)
Total Income (All Sources)	100,430 (108,373)	77,301 (78,350)	132,530 (133,239)	101,773 (103,462)	113,393 (111,023)
Weighted N	236,727	137,591	99,136	31,771,224	7,250,417
Sample Size	2,233	1,208	1,025	314,162	69,340

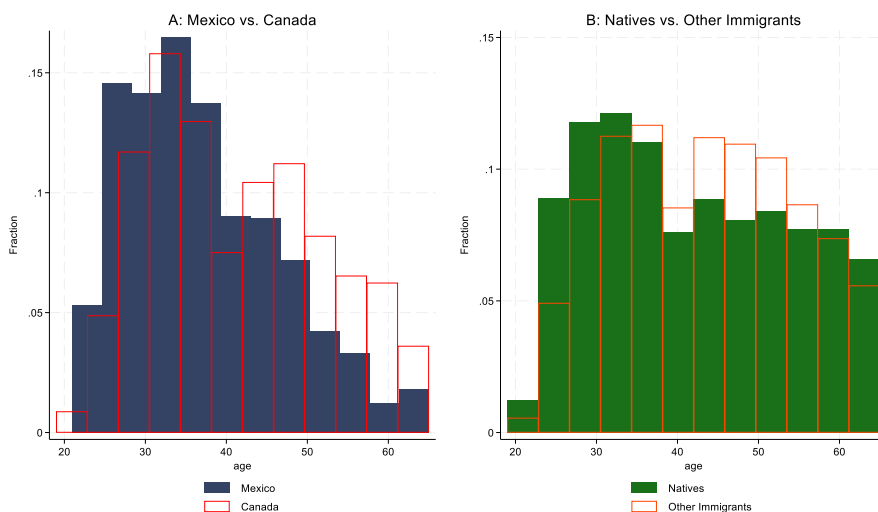
Source: Data from 2021–22 combined ACS.

Age and Sex Distributions

The first three rows of Table 2 show the average age and the sex distribution of TN professionals, with standard deviations in parentheses. On average, TN professionals appear slightly younger (38.52 years) than native-born workers and other non-TN skilled immigrants (40.83 and 42.44 years, respectively). There are also significant age differences between Mexican and Canadian TN workers, with Mexican workers being, on average, four years younger than their Canadian counterparts (36.86 versus 40.81 years).

Figure 9 further illustrates these age differences by displaying histograms of the age distributions for Mexican and Canadian TN professionals (panel A) and for college-educated, native-born workers and other immigrants in TN-eligible occupations (panel B). Compared to Mexican workers, Canadian TN professionals have a larger proportion of individuals in the older age bracket (above 45 years), while Mexican workers are more concentrated in the younger age range (20–45 years), with significantly fewer individuals above age 45. The older average age of Canadian TN workers can be attributed to their higher concentration of individuals aged 45–65 years.

Figure 9 – Age Distributions of TN Professionals



Source: Data come from the 2021 and 2022 ACS.

Note: Figures display histograms of the age distribution of different groups of skilled college-educated professionals in TN-eligible occupations.

Panel B depicts similar histograms for skilled native-born workers and other immigrants in TN-eligible occupations. In contrast to TN professionals, these groups exhibit a more uniform age distribution, with a larger proportion of individuals in the older age range (45–65 years). This contrast suggests that the TN program could be an important tool for increasing the labor supply of young professionals in TN-eligible occupations, especially as the existing domestic workforce continues to age.

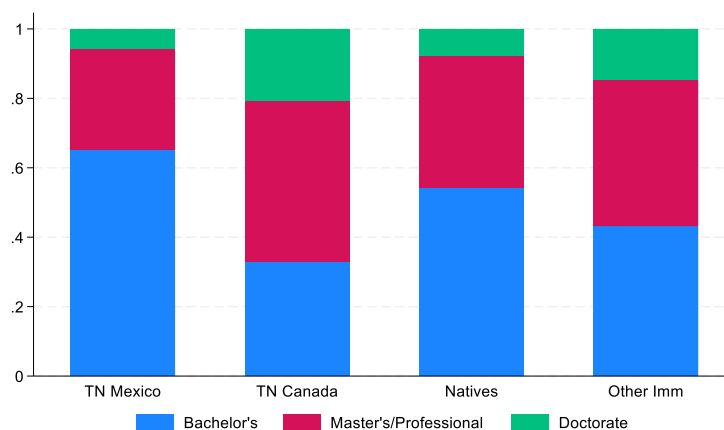
In terms of sex, TN workers have a higher proportion of males compared to females (55% versus 45% as shown in Table 2). This imbalance is entirely driven by Mexican TN professionals, of whom 58% are male and only 42% are female. Canadian TN professionals, on the other hand, have a nearly even sex distribution, with 51% male and 49% female. Interestingly, native-born workers are more likely to be female (55%) than male (45%), while other immigrant workers have a balanced sex distribution.

These differences in age and sex across groups could be a result of a multitude of factors. The types of occupations and employers that hire TN professionals may favor roles that are more likely to attract younger males. Additionally, demographic shifts in Mexico and Canada may contribute to the observed patterns across ages and sexes. Finally, changing labor market dynamics across nations may influence the different distributions of age and sex within these groups.

Educational Attainment

Although the TN program primarily selects skilled workers, defined as those with at least a bachelor’s degree, there is significant variation in educational attainment among college-educated workers. Figure 10 illustrates the distribution of educational attainment (i.e., bachelor’s degree, master’s/professional degree, or doctoral degree) for the groups in Table 2.

Figure 10 – Educational Attainment of Skilled Workers in TN Occupations



Source: Data come from the 2021 and 2022 ACS.

Note: Figures represent the share of each worker group with bachelor’s, master’s, or doctoral degrees.

The majority of Mexican TN professionals possess a bachelor’s degree (65%), with most of the remaining individuals having either a master’s or professional degree (29%). Only a small percentage of TN professionals from Mexico hold a doctoral degree (6%). In contrast, Canadian TN professionals are more likely to have post-baccalaureate education, with nearly 50% possessing a master’s or professional degree and over 20% possessing a doctoral degree. A much smaller proportion of Canadians hold only a bachelor’s degree (33%).

In comparison, native-born workers and other non-TN immigrants primarily hold bachelor’s and master’s or professional degrees, with roughly equal shares at each level and a smaller proportion holding doctoral degrees. These differences in educational

attainment indicate that the TN program may be particularly effective in addressing specific occupational gaps that require advanced degrees. Canadian TN workers may provide a highly skilled labor supply for occupations that demand substantial technical expertise and doctoral-level training, while Mexican TN workers may contribute more to roles that require bachelor's degrees.

Wages/Income

The bottom rows of Table 2 display average wages and total income for the four different groups of college-educated workers in TN-eligible occupations. To provide more descriptive detail, Figure 11 shows the distributions of weekly wages and total annual income across these groups. The upper panels compare distributions for Mexicans and Canadians, while the lower panels compare distributions for native-born workers and other immigrants.

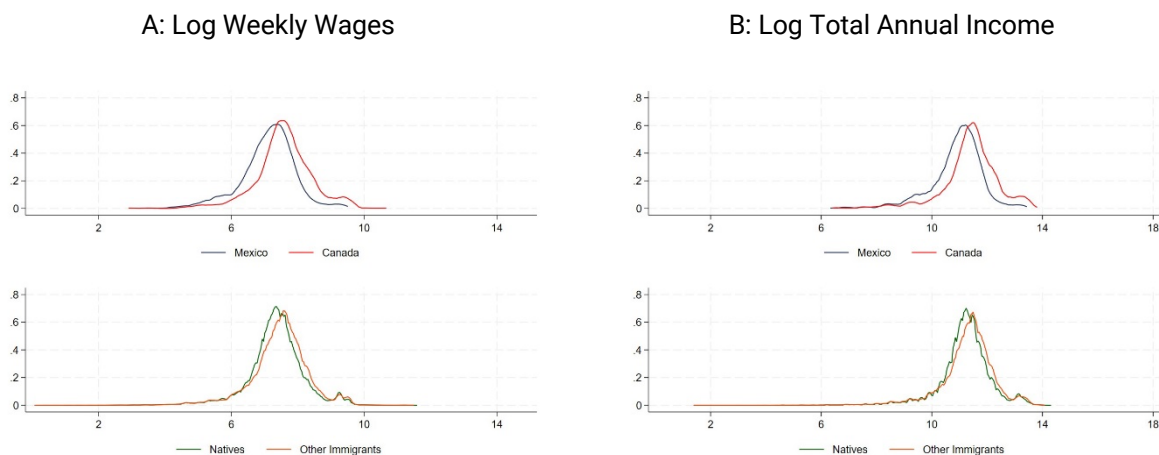
Average weekly wages are highest for Canadian TN professionals (\$2,810) and lowest for Mexican TN professionals (\$1,623). These substantial differences in average wages are also reflected in wage distributions, where Canadian wages exhibit first-order stochastic dominance over Mexican wages. Other immigrants earn average weekly wages of \$2,364, followed by native-born workers with an average of \$2,115 per week. Total annual income follows a similar pattern, with Canadians earning the highest annual income at \$131,350, followed by other immigrants at \$112,786, native-born workers at \$99,797, and finally Mexicans at \$77,090.

What accounts for the significant difference in earnings/income between Canadian and Mexican TN workers? The differences in occupation, geographic location, education, age, and sex, as discussed earlier, certainly contribute to this gap. To better understand the source of these differences, simple Mincer-style wage regressions (i.e. earnings as a function of education, experience, etc.) were conducted on the sample of TN workers from Canada and Mexico. Log weekly wages are first regressed on a dummy for Mexican origin, yielding an unadjusted log wage gap of 0.47 log points. After controlling for age, age squared, education, occupation, and state fixed effects, the log wage gap narrowed to 0.29 log points. This indicates that while the observed demographic and other factors are significant, they do not fully account for the wage difference between Canadians and Mexicans. There still remains a roughly 30% difference in wages.

While difficult to empirically identify, the remaining wage gap between Canadian and Mexican TN professionals may be due to various factors related to U.S. and host country labor markets. Canadian workers may have higher reservation wages if they have ample high-paying job opportunities in Canada, which could lead U.S. firms to offer higher wages to attract them compared to Mexican TN professionals. Alternatively, differences in the abilities of Canadian and Mexican TN professionals to navigate the U.S. labor market may play a role. Canadian professionals, with easier access to the United States and greater proficiency in English, may be able to secure higher-paying job opportunities. Finally, differences in labor supply may also explain part of the wage gap. As shown earlier in Figure 2A, Mexican TN professionals have grown in number,

especially in recent years, while the number of Canadian TN professionals has remained stable. The growing supply of Mexican TN professionals could have reduced their wages relative to other comparable workers.

Figure 11 – Wage and Income Distributions for Skilled Workers in TN Occupations (2021–22)



Source: Data come from the 2021 and 2022 ACS.

Note: All values are converted to constant 2022 dollars. Weekly wages are calculated by taking annual wage income and dividing by the number of weeks worked in the prior year. Sample includes college-educated workers in TN-eligible occupations.

Labor Market Effects of TN Workers

The analysis concludes by examining the labor market effects of TN professionals on the wages and employment of domestic workers. Using yearly variations in TN employment across occupations and states over time, this section assesses whether there are any correlations with the employment and wages of domestic workers, both native-born and foreign-born.

Before turning to the analysis, it is crucial to emphasize that various factors may simultaneously influence both the supply of TN professionals and the wages and employment of domestic workers. Therefore, it is important to emphasize that these findings do not indicate causality. To address some of these concerns, a panel fixed effects specification was used, accounting for narrow-occupation fixed effects, broad occupation-by-year effects, and also state-by-year effects. Nonetheless, other factors — which could simultaneously change within occupation-state groups over time — remain a concern. Furthermore, the demanding nature of this specification, combined with potential measurement errors in identifying TN workers, renders the overall results less precise. The hope is that this preliminary investigation will spur future research using

more rigorous methods to estimate the causal impact of TN workers on the labor market.

To estimate the effects of TN workers on the wages and employment of domestic workers, the following empirical specifications were implemented:¹⁵

$$\frac{\Delta E_{ost}^{Domestic}}{E_{ost}} = \alpha + \beta \frac{\Delta E_{ost}^{TN}}{E_{ost}} + \gamma_{os} + \gamma_{st} + \gamma_{ot} + \varepsilon_{ost} \quad (1)$$

$$\frac{\Delta W_{ost}^{Domestic}}{W_{ost}^{Domestic}} = \alpha + \beta \frac{\Delta E_{ost}^{TN}}{E_{ost}} + \gamma_{os} + \gamma_{st} + \gamma_{ot} + \varepsilon_{ost} \quad (2)$$

The dependent variable in equation 1 is the yearly change in employment of domestic workers, standardized by previous year employment of all workers in occupation *o*, in state *s*, in year *t* $\left(\frac{\Delta E_{ost}^{Domestic}}{E_{ost}}\right)$. The dependent variable in equation 2 is the yearly percentage change in wages of domestic workers in occupation *o*, in state *s*, in year *t* $\left(\frac{\Delta W_{ost}^{Domestic}}{W_{ost}^{Domestic}}\right)$.

The primary independent variable of interest is the yearly change in employment of TN professionals, standardized by the previous year's total employment of all workers $\left(\frac{\Delta E_{ost}^{TN}}{E_{ost}}\right)$. This provides a measure of the inflow of TN professionals into labor markets, defined by occupation-by-state cells each year. The design also includes occupation-by-state, state-by-year, and occupation-by-year fixed effects. These help control for fixed differences across occupation-states and time-varying shocks specific to states or occupations. The primary coefficient of interest, β , reveals the associations between the employment and wages of domestic workers and inflows of TN professionals.

Variations within occupation-state cells over time were analyzed, treating each occupation-state combination as a distinct labor market. Employment and average weekly wages were aggregated at the occupation-state-year level for each domestic worker group. Note that cross-area/-occupation variation may have been contaminated by mobility of individuals across these units in response to immigration. A partial solution was to aggregate occupations to a higher level. This was done by aggregating the more than 60 TN-eligible occupations into six groups: 1) engineers, 2) scientists, 3) health professionals, and 4) social scientists, 5) science technicians, and 6) other professionals. A panel following the six occupation groups across 50 states over 22 years (2000–22) was built, yielding a balanced longitudinal dataset of 5,214 observations, allowing wage and employment to be reliably tracked.

The results are presented in Table 3. Panel A displays the findings for average weekly wages, while Panel B shows the results for employment. The first three columns cover the entire period from 2000–22, while the latter three columns exclude post-2020 years

due to the COVID-19 pandemic. The results show an overall negative correlation between inflows of TN workers and the average weekly wages of domestic workers (both native-born and immigrants). However, the magnitude of this effect is relatively small. The -0.074 coefficient in column 1 suggests that a 1 standard deviation increase in the inflow of TN workers (0.0094) reduces domestic workers' wage growth by 0.07 percentage points ($0.0094 * -0.074 = 0.0007$). This represents roughly 2% of average domestic wage growth of 3%.

The differences between domestic, native-born workers, and foreign-born workers (excluding Mexicans and Canadians) are explored in Table 3, columns 2 and 3. The results show that much of the negative association is specific to native-born workers. Specifically, a 1 standard deviation increase in the inflow of TN workers is associated with a 0.23 percentage point ($0.0094 * -0.242 = -.0023$) reduction in wage growth for native-born college-educated workers in TN occupations, suggesting that TN workers may be more substitutable for native-born workers. In contrast, domestic immigrant workers (column 3) exhibit a positive association with TN workers, possibly indicative of some complementarities. Notably, this overall pattern remains roughly consistent even when excluding the COVID-19 pandemic years.

Panel B explores the relationship between the inflow of TN workers and the employment of domestic workers. The coefficients across specifications are uniformly positive but statistically imprecise. These positive coefficients provide some reassurance against concerns over reactive mobility of domestic workers away from labor markets experiencing high inflows of TN professionals. One would expect to see negative associations if high-earning domestic workers were leaving such markets, following inflows of TN professionals. However, the effect sizes are relatively small. Specifically, a 1 standard deviation increase in the inflow of TN workers is associated with a 0.3 percentage point ($0.0094 * 0.290$) increase in employment growth for domestic workers. Given that average employment growth was 3.5% for domestic workers, this effect represents approximately 8.5% of the average employment growth.

Table 3 – TN Employment and Labor Market Outcomes of Domestic Workers

Panel A: Dependent Variable is Yearly Percentage Change in Wages						
	All Years 2000–22			2000–19, Excluding Pandemic		
	All	Natives	Immigrants	All	Natives	Immigrants
Change in TN Employment, Standardized by Total Employment in Prior Year	-0.074 (0.295)	-0.242 (0.339)	0.549 (0.819)	-0.042 (0.314)	-0.242 (0.356)	0.907 (0.858)
N	5,214	5,214	5,214	4,503	4,503	4,503
r2	0.347	0.347	0.301	0.302	0.303	0.298
Panel B: Dependent Variable is Yearly Change in Employment, Standardized by Total Employment in Prior Year						
	All Years 2000–22			2000–19, Excluding Pandemic		
	All	Natives	Immigrants	All	Natives	Immigrants
Change in TN Employment, Standardized by Total Employment in Prior Year	0.290 (0.359)	0.247 (0.300)	0.042 (0.148)	0.622 (0.395)	0.511 (0.320)	0.111 (0.166)
N	5,214	5,214	5,214	4,503	4,503	4,503
r2	0.287	0.289	0.258	0.288	0.291	0.261

Source: Regressions performed on the IPUMS data described earlier.

Note: Table shows regression results from equation 1 (panel A) and 2 (panel B). Results are provided separately for all domestic college-educated workers in TN-eligible occupations, native-born college-educated workers in TN-eligible occupations, and foreign-born college-educated workers in TN-eligible occupations (excluding Canadians and Mexicans). Standard errors are clustered at the occupation-state level.

*, **, *** denote significance at the 10%, 5% and 1% levels, respectively. The absence of asterisks indicates none of the estimates have reached statistical significance at any of the specified levels.

Conclusion: Analyzing the Evolution and Impact of the TN Program

Established in 1994, the TN guest worker program has become an important pathway for Mexican and Canadian skilled professionals to contribute to the U.S. labor force. This paper broadens our understanding of the number and characteristics of Mexican and Canadian TN professionals working in the United States over the past 30 years. Existing government data on visa issuances and admissions do not provide an accurate count or detailed characteristics of TN workers. Therefore, this paper describes the development of an innovative technique for measuring the presence of TN workers using U.S. census and American Community Survey microdata.

This analysis reveals several notable patterns. First, the TN worker population has exhibited continual growth in the U.S. economy over the past 30 years, rising from roughly 80,000 individuals in 2000 to over 130,000 in 2022. Interestingly, this growth appears to be entirely driven by Mexican nationals, as the number of Canadian workers has remained relatively stable over time. Although Canadians initially accounted for the majority of TN workers, Mexican TN employment accelerated in 2015, with Mexicans now comprising the majority of all TN workers.

TN professionals are concentrated in specific occupations according to the list of TN-eligible occupations, with some occupations having considerably more TN workers than others. These include important STEM occupations such as mechanical and industrial engineers, as well as health-related occupations such as veterinarians and medical scientists. Furthermore, TN professionals tend to be geographically distributed in states with large preexisting immigrant populations. However, this correlation is relatively weak, indicating that TN workers may also help fill skilled labor gaps in areas that typically have fewer skilled foreign-born workers.

Currently, TN professionals are generally older (with an average age of almost 40), highly educated (almost 50% possess a graduate degree, either a master's or doctorate), and earn an average income of \$100,000 per year. However, there are significant differences between Mexican and Canadian TN professionals. For example, Mexicans tend to be younger, more likely to be male, less likely to hold a graduate degree, and earn considerably less than their Canadian counterparts. As Mexican TN employment continues to grow, it is likely that these characteristics will become more prominent within the TN worker population.

Finally, a preliminary analysis of the relationship between inflows of TN workers and the labor market outcomes for domestic workers was conducted. The findings point to a small negative correlation with the wages of native-born workers, meaning that as the number of TN workers increases, the wages of native-born workers decrease slightly. We also found a small positive association with native-born employment, meaning that as the number of TN workers increases, the number of native-born workers also

increases. These results are not causal, and further research is needed to investigate these associations more rigorously and establish causality.

The TN program has the potential to be a primary pathway for skilled immigrants to work in the United States. Currently, the H-1B visa is the main pathway for college-educated foreign nationals to enter the U.S. workforce, but it is capped at 85,000 per year for private-sector employers. The total number of existing TN workers already appears to exceed this number, and continued strong growth in Mexican TN professionals may allow the program to eventually surpass the H-1B visa program. Geographic proximity and interconnectedness within North America are likely to support this continued growth. The various trends and characteristics outlined in this paper are a first step toward understanding the TN guest worker program and its effects on the U.S. labor market and economy. Future research will be needed to uncover the factors contributing to these descriptive findings.

Appendix

Table A.1 – List of TN-Eligible Occupations

Profession ¹	Minimum Education Requirements and Alternative Credentials	TN Occupation Code
General		
Accountant	Baccalaureate or Licenciatura Degree; or C.P.A., C.A., C.G.A. or C.M.A.	1
Architect	Baccalaureate or Licenciatura Degree; or state/provincial license ²	2
Computer Systems Analyst	Baccalaureate or Licenciatura Degree; or Postsecondary Diploma ³ or Postsecondary Certificate ⁴ , and three years' experience	3
Disaster Relief Insurance Claims Adjuster (Claims Adjuster Employed by an Insurance Company Located in the Territory of a Party, or an Independent Claims Adjuster)	Baccalaureate or Licenciatura Degree, and successful completion of training in the appropriate areas of insurance adjustment pertaining to disaster relief claims; or three years' experience in claims adjustment and successful completion of training in the appropriate areas of insurance adjustment pertaining to disaster relief claims	4
Economist	Baccalaureate or Licenciatura Degree	5
Engineer	Baccalaureate or Licenciatura Degree; or state/provincial license	6
Forester	Baccalaureate or Licenciatura Degree; or state/provincial license	7
Graphic Designer	Baccalaureate or Licenciatura Degree; or Postsecondary Diploma or Postsecondary Certificate, and three years' experience	8
Hotel Manager	Baccalaureate or Licenciatura Degree in hotel/restaurant management; or Postsecondary Diploma or Postsecondary Certificate in hotel/restaurant management, and three years' experience in hotel/restaurant management	9
Industrial Designer	Baccalaureate or Licenciatura Degree; or Postsecondary Diploma or Postsecondary Certificate, and three years' experience	10
Interior Designer	Baccalaureate or Licenciatura Degree; or Postsecondary Diploma or	11

	Postsecondary Certificate, and three years' experience	
Land Surveyor	Baccalaureate or Licenciatura Degree; or state/provincial/federal license	12
Landscape Architect	Baccalaureate or Licenciatura Degree.	13
Lawyer (Including Notary in the Province of Quebec)	LL.B., J.D., LL.L., B.C.L. or Licenciatura Degree (five years); or membership in a state/provincial bar	14
Librarian	M.L.S. or B.L.S. (for which another Baccalaureate or Licenciatura Degree was a prerequisite)	15
Management Consultant	Baccalaureate or Licenciatura Degree; or equivalent professional experience as established by statement or professional credential attesting to five years' experience as a management consultant, or five years' experience in a field of specialty related to the consulting agreement	16
Mathematician (Including Statistician)	Baccalaureate or Licenciatura Degree	17
Range Manager/Range Conservationist	Baccalaureate or Licenciatura Degree	18
Research Assistant (Working in a Post-Secondary Educational Institution)	Baccalaureate or Licenciatura Degree	19
Scientific Technician/Technologist⁵	Possession of a) theoretical knowledge of any of the following disciplines: agricultural sciences, astronomy, biology, chemistry, engineering, forestry, geology, geophysics, meteorology, or physics; and b) the ability to solve practical problems in any of those disciplines, or the ability to apply principles of any of those disciplines to basic or applied research.	20
Social Worker	Baccalaureate or Licenciatura Degree	21
Sylviculturist (Including Forestry Specialist)	Baccalaureate or Licenciatura Degree	22
Technical Publications Writer	Baccalaureate or Licenciatura Degree; or Postsecondary Diploma or Postsecondary Certificate, and three years' experience	23
Urban Planner (Including Geographer)	Baccalaureate or Licenciatura Degree	24
Vocational Counsellor	Baccalaureate or Licenciatura Degree	25
Medical/Allied Professional		
Dentist	D.D.S., D.M.D., Doctor en Odontologia or Doctor en Cirugia Dental; or state/provincial license	26

Dietitian	Baccalaureate or Licenciatura Degree; or state/provincial license	27
Medical Laboratory Technologist (Canada)/Medical Technologist (Mexico and the United States)⁶	Baccalaureate or Licenciatura Degree; or Postsecondary Diploma or Postsecondary Certificate, and three years' experience	28
Nutritionist	Baccalaureate or Licenciatura Degree	29
Occupational Therapist	Baccalaureate or Licenciatura Degree; or state/provincial license	30
Pharmacist	Baccalaureate or Licenciatura Degree; or state/provincial license	31
Physician (Teaching or Research Only)	M.D. or Doctor en Medicina; or state/provincial license	32
Physiotherapist/Physical Therapist	Baccalaureate or Licenciatura Degree; or state/provincial license	33
Psychologist	State/provincial license; or Licenciatura Degree	34
Recreational Therapist	Baccalaureate or Licenciatura Degree	35
Registered Nurse	State/provincial license; or Licenciatura Degree	36
Veterinarian	D.V.M., D.M.V., or Doctor en Veterinaria; or state/provincial license	37
Scientist		
Agriculturist (Including Agronomist)	Baccalaureate or Licenciatura Degree	38
Animal Breeder	Baccalaureate or Licenciatura Degree	39
Animal Scientist	Baccalaureate or Licenciatura Degree	40
Apiculturist	Baccalaureate or Licenciatura Degree	41
Astronomer	Baccalaureate or Licenciatura Degree	42
Biochemist	Baccalaureate or Licenciatura Degree	43
Biologist	Baccalaureate or Licenciatura Degree	44
Chemist	Baccalaureate or Licenciatura Degree	45
Dairy Scientist	Baccalaureate or Licenciatura Degree	46
Entomologist	Baccalaureate or Licenciatura Degree	47
Epidemiologist	Baccalaureate or Licenciatura Degree	48
Geneticist	Baccalaureate or Licenciatura Degree	49
Geologist	Baccalaureate or Licenciatura Degree	50
Geochemist	Baccalaureate or Licenciatura Degree	51
Geophysicist (Including Oceanographer in Mexico and the United States)	Baccalaureate or Licenciatura Degree	52
Horticulturist	Baccalaureate or Licenciatura Degree	53
Meteorologist	Baccalaureate or Licenciatura Degree	54
Pharmacologist	Baccalaureate or Licenciatura Degree	55
Physicist (Including Oceanographer in Canada)	Baccalaureate or Licenciatura Degree	56
Plant Breeder	Baccalaureate or Licenciatura Degree	57
Poultry Scientist	Baccalaureate or Licenciatura Degree	58
Soil Scientist	Baccalaureate or Licenciatura Degree	59

Zoologist	Baccalaureate or Licenciatura Degree	60
Teacher		
College	Baccalaureate or Licenciatura Degree	61
Seminary	Baccalaureate or Licenciatura Degree	62
University	Baccalaureate or Licenciatura Degree	63

Source: Table reprinted from The Secretariat; author additions.¹⁶

Notes:

¹ A business person seeking temporary entry under this appendix may also perform training functions related to the profession, including conducting seminars.

² “State/provincial license” and “state/provincial/federal license” mean any document issued by a state, provincial, or federal government, or under its authority – but not by a local government – that permits a person to engage in a regulated activity or profession.

³ “Postsecondary Diploma” means a credential issued on completion of two or more years of postsecondary education by an accredited academic institution in Canada or the United States.

⁴ “Postsecondary Certificate” means a certificate issued on completion of two or more years of postsecondary education at an academic institution, by the federal government of Mexico or a state government in Mexico, an academic institution recognized by the federal government or a state government, or an academic institution created by federal or state law.

⁵ A business person in this category must be seeking temporary entry to work in direct support of professionals in agricultural sciences, astronomy, biology, chemistry, engineering, forestry, geology, geophysics, meteorology, or physics.

⁶ A business person in this category must be seeking temporary entry to perform in a laboratory chemical, biological, hematological, immunologic, microscopic, or bacteriological tests and analyses for diagnosis, treatment, or prevention of disease.

Table A.2 – Assignment of TN Eligibility to IPUMS OCC1990 Classification

OCC1990	OCC 1990 Title	TN Eligible	Matched TN Occupation Codes
17	Managers of Food-Serving and Lodging Establishments	Yes	9
23	Accountants and Auditors	Yes	1
26	Management Analysts	Yes	16
43	Architects	Yes	2, 13
44	Aerospace Engineer	Yes	6
45	Metallurgical and Materials Engineers, Various Phrased	Yes	6
47	Petroleum, Mining, and Geological Engineers	Yes	6
48	Chemical Engineers	Yes	6
53	Civil Engineers	Yes	6
55	Electrical Engineer	Yes	6
56	Industrial Engineers	Yes	6
57	Mechanical Engineers	Yes	6
59	Not-Elsewhere-Classified Engineers	Yes	6
64	Computer Systems Analysts and Computer Scientists	Yes	3
67	Statisticians	Yes	17
68	Mathematicians and Mathematical Scientists	Yes	17
69	Physicists and Astronomers	Yes	43, 57
73	Chemists	Yes	46
74	Atmospheric and Space Scientists	Yes	
75	Geologists	Yes	51, 52, 53
76	Physical Scientists, N.E.C.	Yes	54, 55, 56
77	Agricultural and Food Scientists	Yes	39, 47, 59
78	Biological Scientists	Yes	40, 41, 44, 45, 49, 50, 60
79	Foresters and Conservation Scientists	Yes	7, 18, 22, 48, 58, 61
83	Medical Scientists	Yes	32
84	Physicians	Yes	32
85	Dentists	Yes	26
86	Veterinarians	Yes	37
87	Optometrists	Yes	32
88	Podiatrists	Yes	32
89	Other Health and Therapy	Yes	33
95	Registered Nurses	Yes	36
96	Pharmacists	Yes	31
97	Dietitians and Nutritionists	Yes	27, 28
98	Respiratory Therapists	Yes	33
99	Occupational Therapists	Yes	30
103	Physical Therapists	Yes	33
104	Speech Therapists	Yes	33
105	Therapists, N.E.C.	Yes	33, 35
113	Earth, Environmental, and Marine Science Instructors	Yes	62, 64

114	Biological Science Instructors	Yes	62, 64
115	Chemistry Instructors	Yes	62, 64
116	Physics Instructors	Yes	62, 64
118	Psychology Instructors	Yes	62, 64
119	Economics Instructors	Yes	62, 64
123	History Instructors	Yes	62, 64
125	Sociology Instructors	Yes	62, 64
127	Engineering Instructors	Yes	62, 64
128	Math Instructors	Yes	62, 64
139	Education Instructors	Yes	62, 64
145	Law Instructors	Yes	62, 64
147	Theology Instructors	Yes	63
149	Home Economics Instructors	Yes	62, 64
150	Humanities Profs/Instructors, College, N.E.C.	Yes	62, 64
154	Subject Instructors (High School/College)	Yes	62, 64
163	Vocational and Educational Counselors	Yes	25
164	Librarians	Yes	15
166	Economists, Market Researchers, and Survey Researchers	Yes	5, 19
167	Psychologists	Yes	34
173	Urban and Regional Planners	Yes	24
174	Social Workers	Yes	21
178	Lawyers	Yes	14
184	Technical Writers	Yes	23
185	Designers	Yes	8, 10, 11
203	Clinical Laboratory Technologies and Technicians	Yes	20
205	Health Record Tech Specialists	Yes	20
206	Radiologic Tech Specialists	Yes	20
207	Licensed Practical Nurses	Yes	36
208	Health Technologists and Technicians, N.E.C	Yes	20
213	Electrical And Electronic (Engineering) Technicians	Yes	6, 20
214	Engineering Technicians, N.E.C.	Yes	6, 20
215	Mechanical Engineering Technicians	Yes	6, 20
218	Surveyors, Cartographers, Mapping Scientists and Technicians	Yes	12, 20
223	Biological Technicians	Yes	20
224	Chemical Technicians	Yes	20
225	Other Science Technicians	Yes	20
235	Technicians, N.E.C.	Yes	20
375	Insurance Adjusters, Examiners, and Investigators	Yes	4
678	Dental Laboratory and Medical Appliance Technicians	Yes	20, 28

Source: Author's calculations using IPUMS data.

Table A.3 – TN Shares by Occupation Over Time

Occupation	1990	2000	2010	2022
Plant and System Operators, Stationary Engineers	0.0%	0.7%	1.6%	2.8%
Petroleum, Mining, and Geological Engineers	0.7%	1.1%	1.1%	1.6%
Industrial Engineers	0.3%	0.9%	1.1%	1.6%
Podiatrists	0.2%	0.9%	0.0%	1.5%
Veterinarians	0.5%	0.7%	1.0%	1.5%
Medical Scientists	0.8%	1.7%	1.5%	1.4%
Mechanical Engineers	0.4%	0.7%	1.3%	1.4%
Managers of Food-Serving and Lodging Establishments	0.6%	0.9%	1.1%	1.4%
Architects	0.6%	1.0%	0.9%	1.3%
Physicists and Astronomers	0.3%	1.0%	3.5%	1.2%
Engineering Technicians, N.E.C	0.6%	0.9%	1.0%	1.2%
Sales Engineers	0.4%	1.2%	2.7%	1.2%
Urban and Regional Planners	0.3%	0.6%	0.7%	1.2%
Subject Instructors (High School/College)	0.6%	0.9%	1.0%	1.1%
Dietitians and Nutritionists	0.6%	0.4%	0.5%	1.0%
Other Health and Therapy	0.5%	1.5%	0.9%	1.0%
Physical Scientists, N.E.C	0.1%	1.3%	1.5%	0.9%
Aerospace Engineer	0.2%	0.4%	0.2%	0.9%
Chemists	0.6%	0.7%	0.8%	0.9%
Mathematicians and Mathematical Scientists	0.3%	0.7%	1.0%	0.9%
Optometrists	0.2%	0.5%	0.3%	0.9%
Not-Elsewhere-Classified Engineers	0.4%	0.7%	0.7%	0.9%
Physicians	0.7%	0.8%	0.5%	0.8%
Designers	0.5%	0.7%	1.2%	0.8%
Electrical Engineer	0.2%	0.6%	0.9%	0.7%
Dental Laboratory and Medical Appliance Technicians	0.6%	0.4%	0.4%	0.7%
Radiologic Tech Specialists	0.3%	0.5%	0.1%	0.7%
Geologists	0.7%	0.5%	0.6%	0.7%
Chemical Technicians	0.8%	0.9%	1.0%	0.6%
Metallurgical and Materials Engineers, Various Phrased	0.0%	0.3%	0.3%	0.6%
Management Analysts	0.4%	0.6%	0.6%	0.6%
Chemical Engineers	0.4%	1.0%	1.5%	0.6%
Economists, Market Researchers, and Survey Researchers	0.4%	1.1%	1.0%	0.6%
Accountants and Auditors	0.3%	0.5%	0.5%	0.6%
Computer Systems Analysts and Computer Scientists	0.4%	0.7%	0.5%	0.6%
Occupational Therapists	0.4%	0.7%	0.7%	0.6%
Health Technologists and Technicians, N.E.C	0.9%	0.6%	0.5%	0.6%
Surveyors, Cartographers, Mapping Scientists and Technicians	0.1%	0.4%	0.2%	0.5%
Technical Writers	0.4%	0.5%	0.2%	0.5%

Licensed Practical Nurses	0.4%	0.2%	0.2%	0.5%
Psychologists	0.5%	0.3%	0.4%	0.5%
Therapists, N.E.C	0.1%	1.0%	0.8%	0.5%
Biological Scientists	0.7%	0.5%	0.7%	0.5%
Operations and Systems Researchers and Analysts	0.3%	0.5%	0.6%	0.4%
Lawyers	0.2%	0.3%	0.4%	0.4%
Agricultural and Food Scientists	0.9%	1.3%	0.9%	0.4%
Civil Engineers	0.3%	0.7%	0.4%	0.3%
Registered Nurses	0.4%	0.6%	0.5%	0.3%
Dentists	0.3%	0.5%	0.5%	0.3%
Physical Therapists	0.5%	0.6%	0.6%	0.3%
Speech Therapists	0.2%	0.4%	0.4%	0.3%
Clinical Laboratory Technologies and Technicians	0.4%	0.5%	0.9%	0.3%
Vocational and Educational Counselors	0.2%	0.4%	0.5%	0.3%
Social Workers	0.3%	0.4%	0.4%	0.3%
Biological Technicians	0.2%	0.8%	1.2%	0.2%
Pharmacists	0.2%	0.2%	0.1%	0.2%
Foresters and Conservation Scientists	0.0%	0.3%	0.3%	0.2%
Insurance Adjusters, Examiners, and Investigators	0.2%	0.3%	0.0%	0.1%
Librarians	0.3%	0.3%	0.3%	0.1%
Atmospheric and Space Scientists	0.1%	0.2%	0.0%	0.0%
Respiratory Therapists	0.4%	0.7%	0.0%	0.0%
Health Record Tech Specialists	0.4%	0.3%	1.3%	0.0%
Locomotive Operators (Engineers and Firemen)	0.0%	0.0%	0.0%	0.0%
Ship Crews and Marine Engineers	0.0%	0.3%	0.0%	0.0%
Operating Engineers of Construction Equipment	1.3%	2.8%	2.5%	0.0%
Other Science Technicians	0.7%	0.7%	0.0%	0.0%

Source: Author's calculations using IPUMS data.

Table A.4 – TN Shares by State Over Time

State	1990	2000	2010	2022
Alabama	0.2%	0.3%	0.1%	0.2%
Alaska	0.0%	0.2%	0.7%	0.5%
Arizona	0.5%	1.1%	1.1%	0.6%
Arkansas	0.4%	0.1%	0.0%	0.1%
California	0.9%	1.1%	1.1%	1.1%
Colorado	0.3%	0.6%	0.7%	0.6%
Connecticut	0.3%	0.5%	0.7%	0.4%
Delaware	0.1%	0.5%	0.9%	0.1%
District Of Columbia	0.3%	0.7%	0.2%	0.9%
Florida	0.4%	0.8%	0.7%	0.4%
Georgia	0.3%	0.5%	0.6%	0.5%
Hawaii	0.6%	0.5%	0.7%	0.4%
Idaho	0.2%	0.7%	0.7%	0.3%
Illinois	0.4%	0.5%	0.5%	0.6%
Indiana	0.2%	0.3%	0.1%	0.2%
Iowa	0.4%	0.2%	0.2%	0.0%
Kansas	0.0%	0.3%	0.4%	0.5%
Kentucky	0.2%	0.4%	0.2%	0.3%
Louisiana	0.3%	0.4%	0.5%	0.3%
Maine	0.6%	0.9%	0.9%	0.8%
Maryland	0.2%	0.3%	0.3%	0.2%
Massachusetts	0.4%	0.8%	0.6%	0.3%
Michigan	0.5%	0.7%	0.9%	1.0%
Minnesota	0.2%	0.4%	0.4%	0.5%
Mississippi	0.3%	0.1%	0.1%	0.8%
Missouri	0.2%	0.3%	0.2%	0.1%
Montana	0.3%	0.5%	0.9%	0.8%
Nebraska	0.1%	0.3%	0.0%	0.2%
Nevada	0.8%	0.9%	0.3%	1.4%
New Hampshire	0.1%	0.8%	0.8%	0.4%
New Jersey	0.2%	0.4%	0.3%	0.3%
New Mexico	0.1%	0.7%	0.5%	0.7%
New York	0.3%	0.6%	0.6%	0.6%
North Carolina	0.2%	0.5%	0.4%	0.3%
North Dakota	0.6%	1.3%	0.1%	1.0%
Ohio	0.2%	0.3%	0.2%	0.2%
Oklahoma	0.3%	0.3%	0.5%	0.4%
Oregon	0.4%	0.9%	0.5%	0.9%
Pennsylvania	0.2%	0.3%	0.3%	0.4%
Rhode Island	0.3%	0.2%	0.2%	0.1%
South Carolina	0.2%	0.4%	0.5%	0.4%
South Dakota	0.1%	0.4%	0.6%	1.0%
Tennessee	0.2%	0.4%	0.3%	0.4%
Texas	0.7%	1.2%	1.3%	1.5%
Utah	0.6%	0.4%	1.3%	0.9%

Vermont	0.4%	1.3%	0.2%	0.5%
Virginia	0.2%	0.5%	0.3%	0.4%
Washington	0.6%	0.9%	1.2%	0.9%
West Virginia	0.2%	0.3%	0.4%	0.4%
Wisconsin	0.2%	0.4%	0.4%	0.2%
Wyoming	0.5%	0.0%	0.0%	0.0%

Source: Author’s calculations using IPUMS data.

Notes

¹ The term “sex” has been selected for use in this paper rather than gender. Sex refers to an individual’s biological and physiological characteristics and is usually assigned at birth. Gender, on the other hand, is a social construct encompassing a person’s behaviors, intrinsic identity, and appearance. The sex of TN workers was determined through individual responses to survey questions.

² For example, see Pia Orrenius Pia and Daniel Streitfeld, “TN Visas: A Stepping Stone Toward a NAFTA Labor Market,” *Southwest Economy* 6 (2006), https://www.researchgate.net/publication/5030834_TN_Visas_a_stepping_stone_toward_a_NAFTA_labor_market; Camelia Tigau, “US Visas for Foreign Professionals: Insights on H-1B and TN Visas” (Houston: Rice University’s Baker Institute for Public Policy, 2017), <https://www.bakerinstitute.org/research/crackdown-high-skilled-visas>; and Tony Payan and Jose Ivan Rodriguez-Sanchez, “Revamping the TN Visa to Get Workers Where the US Needs Them” (Houston: Rice University’s Baker Institute for Public Policy, June 7, 2023), <https://doi.org/10.25613/fnz6-n630>.

³ Data on nonimmigrant visa issuances come from U.S. Department of State, “Nonimmigrant Visa Statistics,” FY1997–2023 NIV Detail Table, <https://travel.state.gov/content/travel/en/legal/visa-law0/visa-statistics/nonimmigrant-visa-statistics.html>.

⁴ Data on TN admissions come from the U.S. Department of Homeland Security, “Nonimmigrant Admissions Annual Flow Report,” 2004–22, <https://www.dhs.gov/ohss/topics/immigration/nonimmigrant-afr>.

⁵ The Annual Flow Report from July 2012 documents that “I-94 admissions in 2010 and 2011 were greater than in previous years due to land admission counting changes. By March 2010, the Department of Homeland Security completed updates to computer systems so that nearly all I-94 land admissions—initial and subsequent entries of an individual—were recorded. Previously, at land ports, typically only the initial admission was counted” (Randall Monger, “Nonimmigrant Admissions to the United States: 2011,” Annual Flow Report, U.S. Department of Homeland Security, July 2012, https://www.dhs.gov/sites/default/files/publications/Nonimmigrant_Admissions_2011.pdf).

⁶ U.S. Department of State, “Nonimmigrant Visa Statistics: Nonimmigrant Visa Issuances by Visa Class and Nationality,” <https://travel.state.gov/content/travel/en/legal/visa-law0/visa-statistics/nonimmigrant-visa-statistics.html>.

⁷ Office of Homeland Security Statistics, “Immigration: Nonimmigrant Admissions,” posted April 16, 2024, <https://ohss.dhs.gov/topics/immigration#table-data-heading>.

⁸ Takao Kato and Chad Sparber, “Quotas and Quality: The Effect of H-1B Visa Restrictions on the Pool of Prospective Undergraduate Students From Abroad,” *Review of Economics and Statistics* 95, no. 1 (2013): 109–26, https://doi.org/10.1162/REST_a_00245; Kevin Shih, “Labor Market Openness, H-1B Visa Policy, and the Scale of International Student Enrollment in the United States,” *Economic Inquiry* 54, no. 1 (2016): 121–38. <https://doi.org/10.1111/ecin.12250>.

⁹ Data accessed from Integrated Public Use Microdata Series (IPUMS) USA, “US Census Data for Social, Economic, and Health Research,” <https://usa.ipums.org/usa/>; and Steven Ruggles et al., IPUMS USA: Version 15.0 [dataset]. Minneapolis, MN: IPUMS, <https://www.ipums.org/projects/ipums-usa/d010.V14.0>.

¹⁰ “North American Free Trade Agreement,” The Secretariat, last modified May 26, 2020, https://can-mex-usa-sec.org/secretariat/agreement-accord-acuerdo/nafta-alena-tlcan/chapter-chapitre-capitulo_16.aspx?lang=eng#Ap1603.D.1.

¹¹ OCC1990 is a consistent classification of occupations using the 1990 coding of the U.S. Census Bureau. Slight adjustments were made to ensure time-consistency through 2022. For more detail, see “OCC1990,” IPUMS USA, https://usa.ipums.org/usa-action/variables/OCC1990#description_section.

¹² George J. Borjas, “The Earnings of Undocumented Immigrants.” National Bureau of Economic Research, Working Paper 23236, 2017, <https://www.nber.org/papers/w23236>.

¹³ Data on foreign-born share in population by state come from Shabnam Shenasi Azari et al., “The Foreign-Born Population in the United States: 2022,” American Community Survey Brief, U.S. Census Bureau, April 2024, <https://www2.census.gov/library/publications/2024/demo/acsbr-019.pdf>.

¹⁴ Shenasi Azari et al.

¹⁵ These specifications are popularly used to estimate the labor market effects of immigration, such as in Giovanni Peri, Kevin Shih, and Chad Sparber, “STEM Workers, H-1B Visas, and Productivity in US Cities,” *Journal of Labor Economics* 33, no. S1 (2015): S225-S255, <https://www.journals.uchicago.edu/doi/abs/10.1086/679061>.

¹⁶ “North American Free Trade Agreement.”



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