Trade and Labor Mobility: The Effect of Increased Tariffs on Immigration

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Abstract

This paper documents the mechanism behind US trade policy as a push and pull factor for migration from dozens of countries, different manufacturing industries, and US regions with heterogeneous employment exposure to industry specific tariffs. I show that more migrants come to the US from countries that are more exposed to tariff increases, from more exposed industries within an origin country, and move to US commuting zones with higher exposure to the increases. In addition, new migrants from more exposed countries and industries tend to move disproportionately to regions with higher initial share of their industry of choice or higher average income, and follow less their origin communities compared to the general migrants' pool. Analysis of firm level data about employment-based Green Card eligibility illustrates how US firms increased their sourcing flows from more exposed countries and industries. Finally, a multi country and multi industry model quantifies trade and migration in general equilibrium. The estimation results indicate that international migration increases global welfare, but with distributional implications on foreign and US workers. Explicitly, the labor mobility channel mitigates the effect of tariffs on welfare, and is globally welfare enhancing. Moreover, this channel operates as a force that equates welfare changes between the US and foreign countries, similar to its role in currency unions (Mundell, 1961). All together are new evidence for the substitution between unrestricted trade with factor immobility, and restricted trade with factor mobility (Mundell, 1957).

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1 Introduction

"There are two extreme cases between which are to be found the conditions in the real world: there may be perfect factor mobility but no trade, or factor immobility with unrestricted trade. The classical economists generally chose the special case where factors of production were internationally immobile"

"International Trade and Factor Mobility", Mundell (1957)

One of the most consequential decisions in life is the decision of where to live. This decision determines, and is shaped by, access to different amenities, consumption varieties, occupations, and income levels (Fajgelbaum and Gaubert, 2020; Moretti, 2011; Roback, 1982). All of those are not pinned down by local factors solely. Rather, international economic dynamics shape demand, supply, and trade; and this way, local consumption, prices, and wages. Hence, one may wonder how they are all connected. This paper explores this intuition and documents the mechanism behind trade policy as a push and pull factor for migration from dozens of countries and industries.

As Mundell (1957) noted, by embracing the assumption of factor immobility, the international economics literature focused on flows of goods across borders. Various models document the effect of reducing trade barriers and trade costs on trade volumes, goods variates, and quantities (Arkolakis et al., 2012; Eaton and Kortum, 2002). In this paper, I analyze the migration response when those trade barriers increase. Following Mundell's (1957) logic, I document how when trade becomes more limited, the dual-dimension of factor mobility responds. Namely, instead of trade flows – immigration flows of workers boom.

Using annual immigration flows to the US from 50 countries between 2014 to 2019, I construct event study models which identify the causal relationship between tariff shocks and migration flows. I base my models on 3 margins of variation: cross-country analysis due to heterogeneous tariff increases between countries, cross-industry variation within a country, due to heterogeneous tariff increases on a given country, and finally heterogeneous exposure variation among US regions due to different industrial employment composition within the US. As robustness tests, I include models with and without time dimension, timing and population placebo tests, which confirm the main results. A 1% increase of tariff on a given pair of country-industry, leads to 2.5% increase of migrants inflow from this country-industry.

In addition, I use a novel dataset of the universe of US permanent labor authorization

applications, to show how US firms increased sourcing from countries and industries which became more exposed to tariff increases (5.6% sourcing increase for 1% exposure increase). This result provides evidence about a migration mechanism through US firms.

To micro-found the empirical estimation and explore welfare implications, I construct a theoretical model that analyzes two main forces. The first one is the increase in US labor demand due to protectionist policy. This force is a "pull" factor for migrants into the US. At the same time, the migration origins experience a negative labor demand shock as a result of lower tariff-dependent demand, which serves as a "push" factor. Together, the effects on US wages and employment depend on migration elasticity, the domestic consumption expenditure shares, initial probabilities to migrate, and US market size by industry. Figure 1 presents the mechanism of my general equilibrium model. First, tariffs increase exogenously (which is also my empirical identification condition). Next, the existence of tariffs' pass-through to consumers (Fajgelbaum et al., 2019) leads import prices to increase. Hence, due to substitution between domestic and international consumption, US consumers increase their demand for domestic goods and labor. Finally, terms-of-trade effects arise and increase the incentive of foreign workers to migrate. The outcome of this process is increase in the inflow of migrants of groups that are more exposed to tariff increases given, existence of terms-of-trade effect, initial high trade share, and substitution between domestic and international consumption.



Figure 1: The Economics of Tariffs and Migration

This model enables me to estimate the elasticity of migration with respect to the real wage gap between the US and foreign country's wage in a given industry. The migration elasticity is 1.18. That is, a 1% increase in the gap of real wages between the US and a given country, increases the migration flows to the US by 1.18%[1]. Moreover, the estimation results yield an average of 1.2% terms-of-trade gain for the US[2].

Multiple news articles previously mentioned anecdotal evidence of this economic phenomena for the period I analyze. For example, the Wall Street Journal reported on November

[1]This estimate aligns to estimates in other studies of international migration elasticities; see Head and Mayer, 2021

[2]the change in the relative wage gap between the US and another country, for a given industry

2018 that: "*Foxconn Technology Group is considering bringing in personnel from China to help staff a large facility under construction in southern Wisconsin as it struggles to find engineers and other workers in one of the tightest labor markets in the U.S.*". In another local outlet report about the effects of the increased tariffs on a local US labor market, the author mentions that "*The countervailing duty and anti-dumping order, plus another tariff already in place ... After the ruling, Stoughton Trailers grabbed market share and ramped up production. So many new hires were needed, it recruited hundreds of people from Colombia, Nicaragua, Mexico, and Puerto Rico for job. The company, now with more than 1,600 employees, opened a factory ... building a new headquarters*". Other newspapers discussed the importance of immigrant workers at times of labor supply scarcity.[3]

This paper contributes to the literature about the determinant factors of migration, effects of trade barriers, spatial labor market effects due to international factors, and the effects of migrants on local labor markets. Several papers explore the link between trade and migration flows. Del Río and Thorwarth (2009) document trade and migration as complements, focusing on the trade agreement between the US and Mexico. Instead, my framework explores exogenous trade policy change which affects both markets, and includes a continuous change measure with multi country and multi industry heterogeneity, as well as regional analysis over time. Felbermayr and Toubal (2012) show the other direction of my economic mechanism. Namely, they show how migration causes increased bilateral trade. My main contribution in that sense is clear identification of the opposite link, using heterogeneous exogenous shock and an event study framework. This paper documents substitution between migration and trade, and hence strengths and extends Campaniello (2014), who instruments trade using decreased tariffs, and concludes that there is no significant evidence for complementarity between migration and trade once instrumented, and Foschi et al. (2025) who document the labor migration response to different economic shocks.

Moreover, many have studied the extensive effects of the first Trump presidency tariff changes. Fajgelbaum et al. (2019) shows that changes in US tariff policy led to modest prices increase, and decreased trade flows between the US and the targeted countries. Autor et al. (2024) show that these tariffs do not seem to significantly affect the general

[3]https://www.wsj.com/articles/foxconn-considers-bringing-chinese-personnel-to-wisconsin-as-u-s-labor-market-tightens-1541505600
https://www.jsonline.com/story/news/2024/04/24/manufacturing-companies-are-bringing-work-back-to-the-u-s-from-asia/71931591007/
https://www.reuters.com/business/unions-businesses-eye-migrants-fill-labor-gaps-ohio-2024-05-02/
https://www.bloomberg.com/news/articles/2024-03-11/tyson-is-hiring-new-york-immigrants-for-jobs-no-one-else-wants?

employment in the more protected US regions. Although this literature explored the effect of labor market changes, it did not yet consider the effect of international trade policy on the incentive to migrate or source foreign workers. Caliendo and Parro (2015) document the demand and importance of inputs and intermediate goods for production, which is related to the mechanism that I explore in the sense of the necessity of labor inputs.

For the theoretical part, I develop an Armington-Roy model with endogenous labor. This model extend a simplified version of Burstein et al. (2020; BHTV) to include endogenous labor mobility as a result of tariff changes. In my setting, migration flows are not exogenous but rather a result of the economic activity following tariff increase. Namely, as higher tariffs imposed, relative demand changes, terms-of-trade effects take into place, and the wages in the US and other countries change with ambitious direction. All of those shape the migration decisions of workers around the world. My environment relates to Brinatti and Guo (2024), who characterize the effect of migration restrictions on the labor market, following exogenous migration cost changes which push migrants to other places. In my setting, the tariffs change labor market outcomes by shaping both labor demand and supply. Borusyak et al. (2022) studied the labor market implications of increased migrants flows, and what determines their mobility. In the main counterfactual analysis of the model, I show how shutting down labor mobility increases the US welfare from 0.22% to 0.64%, given the observed tariff shocks.

Finally, I contribute to the literature of labor mobility. Several papers documented worker mobility elasticity with respect to different economic shocks (Fajgelbaum et al., 2018; Suárez Serrato and Zidar, 2016; Tombe and Zhu, 2019; Akcigit et al., 2016; Kleven et al., 2013; Moretti and Wilson, 2017). Specifically, Kleven et al. (2019) review the literature of international migration response to local tax policies. Head and Mayer (2021) review papers estimating international migration elasticity among other mobility elasticity types, and mention a median migration elasticity of 1.63, which is close to my estimate of 1.18.

The paper is organized as follows. Section 2 describes data sources and the main measures. Section 3 presents the identification strategy to assess the effect of tariffs on migration, as well as a mechanism of migration. Section 4 provides the results for the cross-country, cross-industry within-country, regional analysis, and wage and firm sourcing mechanisms. Section 5 reports the robustness tests. Section 6 includes the construction and results of endogenous international labor mobility GE model. Section 7 reports counterfactual analysis for the role of labor mobility in adjustments to tariff shocks. Section 8 concludes.

2 Data

2.1 Data sources

I use multiple data sources of migration flows, trade volumes and tariffs, characteristics of US local labor markets, and approved applications of foreign workers linked to their hosting US firm.

Fajgelbaum (2019) data: This data source includes comprehensive documentation of the tariff changes as part of the first Trump administration, and covers changes between February 2018 to April 2019 in HS10 or HS6 levels, as well as product level import data by country. Using this source, I construct the exogenous instruments for my event study models.

American Community Survey: The outcomes' data source is ACS PUMA level data, which I aggregate from PUMA to commuting zone level (cz) using Autor et al (2019) data files. The data includes the flow of migrants which moved to a given CZ in a previous year, from 60 countries and are employed in a given NAICS industry during the first year following migrating. I also collect wages information, and as the suggested mechanism is about labor market active population, I restrict my sample for migrants in the labor force. Moreover, I am able to use the country of origin and industry tariff variation because I observe the industry of employment of the migrants within a year after their migration.

The Bureau of Labor Statistics data: I collect data about region-NAICS6 level employment so I can leverage industry level variation across different regions based on their initial industrial employment shares at 2013.

PREM applications data: I complement the analysis with a unique dataset from the Department of Labor, about the universe of labor based green card applications. The origin of this source is filling of the ETA-9089 form by employers who seek to employ foreign workers. This rich dataset includes employee-employer matched level data about the job title, industry, expected wage, nationality, employment location and more firm characteristics.

The UNIDO Industrial Statistics (INDSTAT) Revision 3 Database: This dataset features annual wages and number of employees by country, year, and industry (ISIC Rev. 3). I use this data to calculate the initial observable values which are required for the theoretical model estimation. Almost all of the migration origins from the ACS setting are covered by this source; I am able to analyze country-industry data of 40 countries and 18 industries.

Next, I combine these datasets in order to create a measure of exposure to the tariffs shocks. Thanks to the heterogeneity of this policy tool, I am able to use 3 levels of exposure variation: across origin countries, across industries within a country, and across origin countries and local US regions.

2.2 Tariff-exposure measurement

I assess the impact of tariff-exposure on several levels. First, is a country which is an important supplier to the US of the taxed goods characterized with higher inflow of migrants to the US, relatively to a country with lower exposure in that sense? Secondly, within a country, does an industry which is more exposed to tariff changes experience higher inflow of migrants to the US compared to less exposed industries in the same country? Finally, do US regions with higher initial employment in more affected industries get more migrants from those industries and increasingly from more exposed countries?

The three matching instruments which enable to answer those questions are the following:[4]

$$\text{Tariff Shock}_{ct} = \Sigma_i \rho_{i,US,c,2013} \widehat{\tau_{i,US,c,t}} \tag{1}$$

$$\text{Tariff Shock}_{ict} = \rho_{i,US,c,2013} \widehat{\tau_{i,US,c,t}} \tag{2}$$

$$\text{Tariff Shock}_{rct} = 1000 \cdot \Sigma_i e_{ir} \rho_{i,US,c,2013} \widehat{\tau_{i,US,c,t}} \tag{3}$$

Where: $\rho_{i,US,c,2013}$ is the vector of shares of US imports from country c of HS10 code products in NAICS3 code i in 2013, $e_{i,r}$ is r's employment share of industry i (NAICS3) in 2013, and $\hat{\tau}_{i,US,c,t}$ is the cumulative tariff increase of HS10 codes in NAICS3 industry i imposed by the US on country c, up to year t. I choose to scale the region-origin-time measure because it is constructed using (small) manufacturing employment shares multiplied by initial import shares.

2.3 Migration flows summary statistics

The analysis of this paper focuses on two groups: the flow of migrants who are in the US labor force, and the industry specific flows. Table 1 describes the first group. In general,

[4] As the data in Fagelbaum 2019 is HS10/NAICS6 level, but employment of migrants in the ACS is NAICS3 level, I aggregate the shock measures to NAICS level

around 1.5 million immigrants move to the US each year. Around 53% of them join the labor force and they constitute around 0.5% of the US labor force on average. Given those facts, it is reasonable to expect that migration adjustments due to tariff policy would not change drastically the labor market structure or outcomes for the entire US labor market, as indeed suggested by Autor et al. (2024, 2025), and confirmed by the quantification of my model. Interestingly, 2017 is characterized by a trend shift in migration which ended an increase of flows up to this year.

Table 1: Immigrant Inflow (in millions) and their Labor Force Share

Year	Immigrants inflow	Inflow in labor force	% of labor force
2014	1.63	0.82	0.51
2015	1.66	0.83	0.51
2016	1.74	0.87	0.54
2017	1.67	0.83	0.51
2018	1.51	0.77	0.46
2019	1.50	0.79	0.47

Next, Table 2 describes the inflow dynamics of new immigrants who are employed in industries which were exposed to the 2018-2019 tariff increases[5]. Again, 2017 illustrates a shift of a previously increase in the total number immigrants in those industries. In this paper, I explore the relative differences of those flows, as function of country-industry heterogeneous exposure to the tariff increases. Lastly, the share of new migrants in the labor force of these industries is similar to the entire workers population.

Table 2: Immigration (in millions) to Tariff-Exposed Industries

Year	Inflow to exposed industries	% of labor force in exposed industries
2014	0.089	0.50
2015	0.096	0.54
2016	0.102	0.57
2017	0.095	0.53
2018	0.093	0.52
2019	0.084	0.47

[5] NAICS 3 codes: "111" "112" "113" "211" "212" "311" "312" "313" "315" "316" "321" "322" "323" "324" "325" "326" "327" "331" "332" "333" "334" "335" "336" "337" "339" "114" "314"

3 Identification Strategy: Event Study Models

3.1 The impact on cross-country migration

To document the first evidence of how trade policy shapes migration, I run the following event study model, with 2017 as the baseline year:

$$\log(\text{Immigrants inflow}_{ct}) = \beta_t \text{Tariff Shock}_{c2019} + \gamma_c + \delta_t + \epsilon_{ct} \tag{4}$$

Where $t \in 2014 : 2019$, weighted by immigrants flow in 2017, with HC1 SE

This model explores for every year, the tendency of countries with higher exposure to tariff increases to send more migrants to the US, given time and country specific shocks, relatively to 2017.

3.2 The impact on migration and migrant workers share across affected industries

One may be worried that other policy changes and factors shaped country specific migration flows between 2017 and 2019, and were not present beforehand. In this case, those changes are not reflected in the pre-treatment estimates, but bias the estimated treatment effect. In order to tackle this possibility, I leverage the within-country cross-industry tariff increases variation, and estimate the following event study model:

$$\log(\text{Immigrants inflow}_{ict}) = \beta_t \text{Tariff Shock}_{ic2019} + \gamma_{it} + \theta_{ct} + \epsilon_{ict} \tag{5}$$

Where $t \in 2014 : 2019$, weighted by immigrants flow in 2017, with standard errors clustered by industry

This model captures within origin country migration decision changes, and tests whether industries that had higher exposure to tariff increases are indeed associated with higher inflow of migrants with the same employment industry within a year post migration. In what follows, this model accounts for any force which shapes country or industry specific migration over time, as those trends are absorbed in the industry-time and country-time fixed effects.

Moreover, I use as an outcome the number of new-migrants inflow from a given country c with employment industry i, divided by the total number of workers in the US employed in industry i. Namely, I estimate equation 6 which documents the effect of tariff shock exposure on the decomposition of US industries with respect to new migrants share, and

test whether more affected industries consist of higher share of new migrant employees from countries which were more exposed to those tariffs after the tariff increases. I estimate the log value of the share because the changes are proportional to the initial value of the outcome, as my theoretical model confirms as well.

$$\log(\frac{\text{Immigrants inflow}_{ict}}{\#\text{Workers}_{it}}) = \beta_t \text{Tariff Shock}_{ic2019} + \gamma_{it} + \theta_{ct} + \epsilon_{ict} \tag{6}$$

Where $t \in 2014:2019$, weighted by initial outcome values, with standard errors clustered by industry.

3.3 The regional effect on migrants employment share

Finally, I use regional variation of the industrial composition of employment in different US commuting zones (cz), to show that new migrants migrated to regions with higher employment in an affected industry. This evidence supports the theory that protected regions attracted more migrant workers compared to "the average US commuting zone".

$$\log(\text{Immigrants inflow}_{rct}) = \beta_t \text{Tariff Shock}_{rc2019} + \gamma_c + \theta_r + \delta_t + \epsilon_{rct} \tag{7}$$

Weighted by total population of cz r in 2017, with HC1 se

3.4 Pulling Mechanism: reallocation of workers to the US

So far, my methodology tests for evidence about the link between trade policy and migration flows (e.g. labor mobility). In the results section, I show how higher migrants flows to the US are from more exposed countries, more exposed industries within an origin country, and that migrants move to more exposed regions within the US.

Next, I present a mechanism of this migration using novel employer-employee level data. As part of the employment process of foreigners, US employers are required to fill Form ETA-9089. This form includes information about the country of origin of this worker, NAICS6 firm industry, education level, job title, expected salary, and more firm and employee characteristics. I access the dataset for the universe of those form applications between 2015-2019 for approved, withdrawn, and rejected foreign workers employment applications. To explore this potential mechanism of sourcing migrants to US countries, I follow the same empirical specification which I construct for the country of origin and industry level analysis with a pre/post regression model.

$$\log(\text{Certified}_{ict}) = \beta_{2018} I(t = 2018) \times \text{Tariff Shock}_{cit} + \beta_{2019} I(t = 2019) \times \text{Tariff Shock}_{cit} +$$

$$\theta_{it} + \theta_{ct} + \theta_{ic} + \epsilon_{ict} \quad (8)$$

3.5 The characteristics of the affected commuting zones: where do affected migrants go?

To understand the nature of those new migration flows after the tariffs increases, I estimate their relative tendency to follow employment related features versus community in their destination choice. Namely, I run a regression of the 2019 migration flow from a given country to a given US commuting zone for migrants who work in a given industry one year after their migration as an outcome. The regression controls represent the initial regional features of the commuting zone: (a) the initial share of migrant stock from a given origin out of the entire CZ population, and (b) the initial share of workers in this CZ who work in a similar industry as the given observation group. The estimated equations are the following:

$$\begin{aligned} \log(\text{Immigrant inflow}_{irc,2019}) = {} & \alpha_1 \,\text{PopShare}_{rc} + \alpha_2 \,\text{IndustryShare}_{ir} \\ & + \beta_1 \,\text{TariffShock}_{rc,2019} \,\text{PopShare}_{rc} \\ & + \beta_2 \,\text{TariffShock}_{rc,2019} \,\text{IndustryShare}_{ir} + \delta_r + \delta_c + \delta_i. \end{aligned} \quad (9)$$

$$\begin{aligned} \log(\text{Immigrant inflow}_{irc,2019}) = {} & \alpha_1 \,\text{PopShare}_{rc} + \alpha_2 \,\text{IndustryShare}_{ir} + \alpha_3 \,\text{AvgInc}_{rc} \\ & + \beta_1 \,\text{TariffShock}_{rc,2019} \,\text{PopShare}_{rc} \\ & + \beta_2 \,\text{TariffShock}_{rc,2019} \,\text{IndustryShare}_{ir} \\ & + \beta_3 \,\text{TariffShock}_{rc,2019} \,\text{AvgInc}_{rc} + \delta_r + \delta_c + \delta_i. \end{aligned} \quad (10)$$

By regressing those controls with regional tariff increase exposure interactions, I am able to capture how in regions which are relatively more exposed to the tariff increases, migrants tend to prefer more (compared to the general migrant population) higher initial share of their industry choice or income, rather than higher initial share of their origin group.

4 Results

4.1 Cross-country migration

As plot 2 shows, there is no pre-trend of increasing or decreasing flow before the treatment in 2017. The exposure to tariffs cause higher migration inflows from countries which are more exposed to the tariff increases. In terms of magnitudes, a 1% increase in country's tariff change exposure yields a 0.14% increase in the migration flow of a given country, and one standard divination in the exposure, leads to $0.7 \times 0.14 \times 100 = 9.8\%$ increase in the inflow of migrants from the associated country compared to the baseline. These results provide the first evidence of increased labor mobility from countries who experienced higher increases in trade-barrier exposure to the US. The estimate aligns with earlier literature about delayed migration following the economic shock that caused it (Foschi et al., 2025).

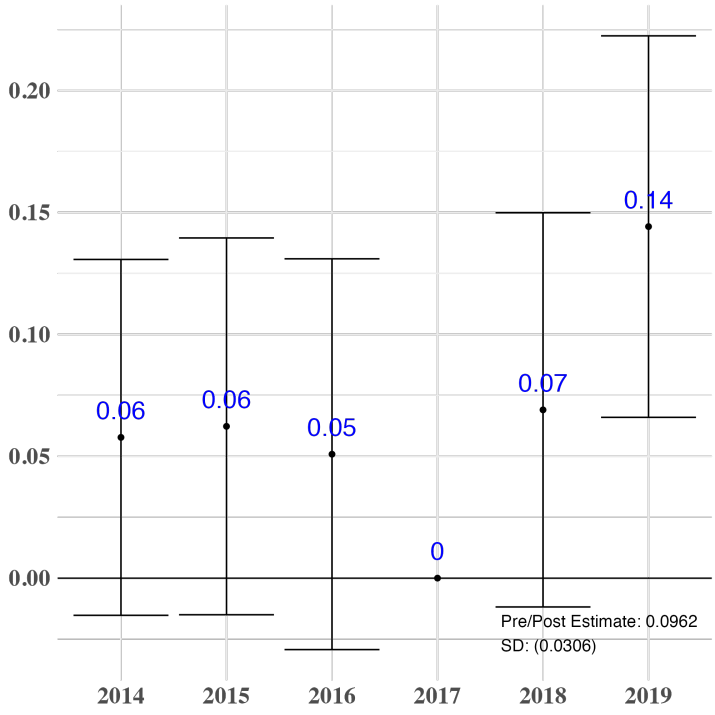


Figure 2: Country Event Study

Note. N = 304; Adj. $R^2 = 0.96$. The y-axis shows estimated coefficients β_t from equation (4). Vertical bars are 95% confidence intervals using robust standard errors (HC1).

4.2 Country-industry analysis

Next, focusing on within origin country variation, as figure 3 shows, there is a clear and consistent effect of within country cross industry tariff exposure on inflow of migrants in those industries. One standard deviation of the exposure metric is associated with $2.5 \times 0.08 \times 100 = 20\%$ increase in the inflow of migrants from the affected country, who work in the affected industry, compared to the baseline. Equivalently, a 1% increase in the tariff exposure led to 2.5% increase in the migration inflow from that country and industry. As the most exposed industries are expected to have higher effect than others, this result is consistent to the cross country estimate and provide stronger evidence for tariff-induced migration. For a given country, industries which were more exposed to US tariffs, sent more migrants to the US compared to other industries. This is true even considering different industry and country time trends during the event window, as those are captured in the interacted fixed effects. The point estimate of this model aligns in scale with other migration elasticity measures. For instance, Friebel et al. (2024) find that a 1% decrease in the distance between migration origin and destination, is associated with 3% more migration intensions. Although it is true that migration intentions are not similar to migration flows due to migration costs - those are absorbed in the industry-time and country-time fixed effects. In addition, Gröger (2021) estimates illustrate how migration flows may be sensitive and highly responsive to economic shocks, as well as heterogeneous between demographic groups. Specifically, an unemployment shock increase by 1 standard deviation to a given country is associated with 10% (full sample) to 47% (poor subgroup) higher migration flows to the US compared to the baseline.

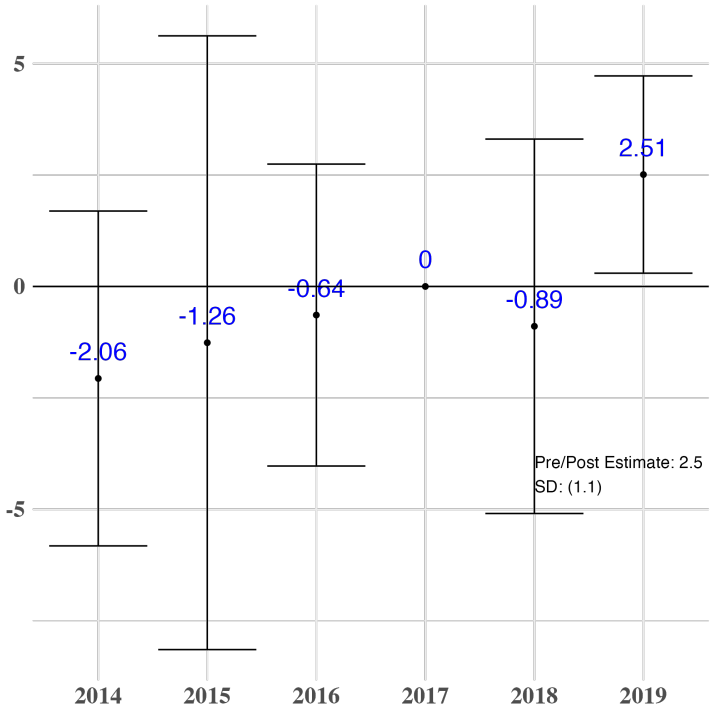


Figure 3: Industry-Country Event Study of Migrant Inflow

Note. N = 540; Adj. $R^2 = 0.58$. The y-axis shows estimated coefficients β_t from equation (5). Vertical bars are 95% confidence intervals with standard errors clustered by industry.

Lastly, the estimate of equation 6 is 2.48 and is statistically significant. That is, a 1% increase in the tariff exposure measure leads to 2.48% growth in the share of new migrants out of the number of workers in a given industry.

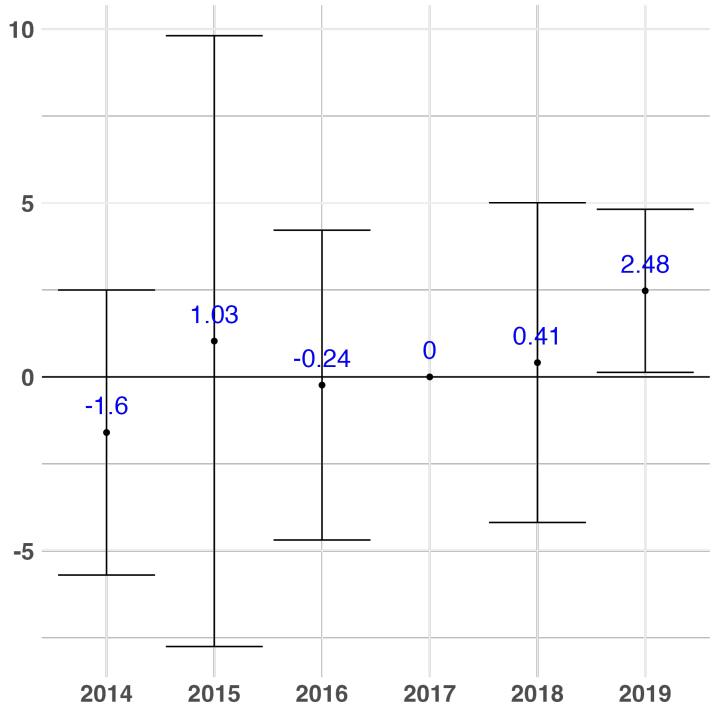


Figure 4: New Migrants as share of Industry's Employment Event Study

Note. N = 540; Adj. $R^2 = 0.89$. The y-axis shows estimated coefficients β_t from equation (6). Vertical bars are 90% confidence intervals with standard errors clustered by industry.

4.3 Regional analysis

Beyond the importance of understanding the tariffs as push factors to the US, I also explore their role as pull factors. Namely, the previous analysis demonstrated how higher exposure of targeted industries and origin countries led to higher migrants flows. That is, the exposure pushed workers to migrate. However, tariffs are bilateral in the sense of affecting both imposing and targeted economies. As I will show in a theoretical result, the tariffs change the relative wages between the US and a given origin country and industry. This results in higher flows of migrants to regions with higher US regional employments share in more exposed industries. The mechanism behind is that regions with higher employment in protected industries benefit more from terms of trade effects, and hence experience positive labor demand shock which pulls migrants.

Indeed, the regional analysis event study documents that more migrants go to regions with higher employment shares in protected industries. The post increases significant estimate, for 2019, implies an increase of $4.83 \times 6.15 * 10^{-02} \times 100 = 29.7\%$ of migrants inflow from countries to regions which are one standard deviation more exposed to the

regional industry employment share weighted sum of industry-country tariff increases. This result establishes the heterogeneous response of a region to a foreign country-industry shock, according to the employment decomposition of a given region. In other words, it is more likely that a migrant from Canada will move to a US region with higher employment share in an industry which the US imposed higher tariffs on, compared to a German migrant who's country was not affected by those tariffs.

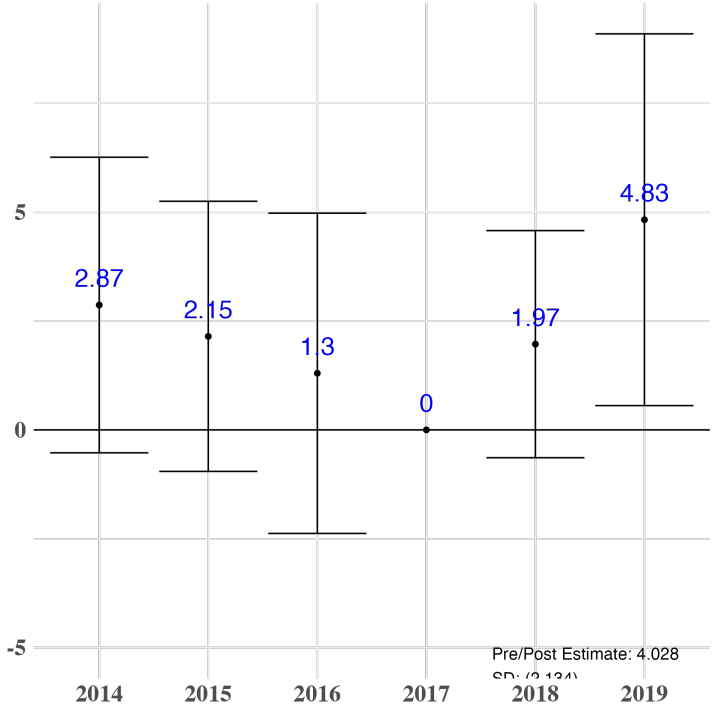


Figure 5: Regional Inflow of Migrants Event Study

Note. N = 11,181; Adj. $R^2 = 0.32$. The y-axis shows estimated coefficients β_t from equation (7). Vertical bars are 95% confidence intervals using robust standard errors (HC1).

4.4 Regional analysis of migrants versus native labor force participation

Finally, motivated by the increased flow of migrants to protected regions, I extend the recent literature on the local labor market effects of trade policy and protectionism (Autor et al., 2024; Autor et al., 2025). Namely, I analyze the log participation rates of new migrants versus US-born workers (equation (7) with $log(\frac{immigrantInflow_{rct}}{TotalPop_{rt}})$, $log(\frac{USBornWorkers_{rct}}{TotalPop_{rt}})$ as outcomes). The results align with Autor et al. (2024) who find no significant employment effects on the general population. Interestingly, the case of migrants is different. More tariff-exposed US regions experienced increased participation of migrants following the tariff increases. This result, and specifically in addition to the comparison to US-born workers

may explain the lack of effect which is found for the general workers population. This results connects to BHTV (2020) and Brinatti and Guo (2024) by documenting no crowding out of US-born workers from the labor market for the affected industries which are considered tradable. The incentive to hire migrant manufacturing workers may originate due to lower hiring costs, with increasing wage gap with respect to US-born workers before the tariffs increase (I include figures of the gap over time in the appendix).

4.5 Mechanism Evidence: US firms increase foreign permanent worker flows

Table 3 reveals one mechanism in which affected workers move to the US. Namely, in parallel timing with the tariff changes, firms in more exposed industries source more foreign workers from more exposed countries. The regression estimate is significant, and accounts for origin-country sourcing shocks, industry specific shocks, and the tendency of firms to source workers from specific country-industry pairs. In magnitude terms, one standard deviation of tariff exposure is associated with $5.64 \times 0.013 \times 100 = 7.3\%$ more migrant workers from the affected industry and country.

As the estimate of 2018 captures, the increased sourcing takes place at the same time as the tariff increases. This aligns with the rational of higher approved applications at 2018, and later higher observed new migration inflows between 2018-2019, and reported at 2019.

Table 3: Regression Results: Effect of Tariff Exposure on Certification

Dependent variable:	$\log(Certified_{ict})$
I(year = 2018) * Tariff Exposure(ict)	5.64**
	(2.96)
I(year = 2019) * Tariff Exposure(ict)	-1.3
	(0.99)
Origin Country-Time FE	YES
Industry-Time FE	YES
Origin Country-Industry FE	YES
Observations	2,068
R^2	0.99
Adjusted R^2	0.98
Residual Std. Error	0.95 (df = 1015)
F Statistic	116*** (df = 1015; 1052)

Note: $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$

4.6 The characteristics of the affected commuting zones: where do affected migrants go?

Table 4 presents the estimation results of the regional characteristics regression. There are several takeaways based on the sign and significance of the estimates. First, for the entire sample of regions, there is a general tendency of migrants choosing destinations which include higher initial shares of migrants from the same origin country (Munshi, 2003; Caballero et al., 2023). Additionally, by construction, there is tendency to migrate and be employed in an industry where that immigrant group is a higher initial share of the current employment industry. This is true, as the industry employment shares are equivalent to the probability to be employed in those industries for homogeneous immigrants from different countries. Beyond those standard migration features, a new heterogeneity emerges between regions with different tariff exposure. Specifically, migrants from a given industry and country tend to move more to regions with higher initial industry employment share, as the exposure of this regions to tariffs on this industry and country increase. Moreover, the tendency to prefer the same migrant community decreases as exposure to tariffs increase, although not statistically significant. To conclude, relative to the general population, migrants from more exposed countries and industries tend to prefer more employment related characteristics of their destination over community ones.

Table 4: Regression Results: Immigrants Flow in 2019

Dependent variable:	$\log(\textit{Immigrants Flow in 2019}_{irc})$
Initial origin population share	10.489^{***}
	(1.830)
Initial industry employment share	3.524^{**}
	(1.615)
Initial origin population share:Tariff Shock_{rc2019}	-33,242.430
	(23,255.910)
Initial industry employment share:Tariff Shock_{rc2019}	$8{,}299.514^{**}$
	(3,629.022)
Observations	2,993
R^2	0.700
Adjusted R^2	0.616
Residual Std. Error	1.320 (df = 2340)
F Statistic	8.360^{***} (df = 652; 2340)

Note: $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$

5 Robustness

To test the sensitivity and the strength of my results, I run different estimation procedures, as well as several placebo tests. All confirm the earlier findings.

5.1 Population placebo and timing placebo

To mitigate the possibility that my models capture general trends of migrants-employment, and not push and pull factors of new migrants, I perform the following analysis. In case that such general trades indeed derive the results, then the event study framework should successfully identify a significant effect on the entire migrants population in the US. So, I use the country-industry model and change the outcome to the total stock of migrant workers from a given country and industry, which are not new migrants. As seen in appendix 8.1, the event study frameworks fail, and detect zero and non-significant estimates. That is, the only group which is responsive to the tariff shocks are the new migrants, who moved to the US following the shock increasingly from more exposed countries and work in more exposed industries.

To complement this placebo test, I perform additional placebo test for the new migrants group itself, which is reported in appendix 8.4. Namely, I estimate the log growth of migrants between a given period and 2016, 2015, and 2014. Those models, which predate the event timing are again not significant and provide zero estimates for any year which pre-dates the tariff increases.

5.2 Pre/post regressions and Wald test for the event study estimates

Finally, I compare the entire pre period migrant flow dynamics to the post period 2019 in a pre-post regression setting. Explicitly, I estimate:

$$\log(\text{Immigrants inflow}_{ct}) = \beta \times \text{Tariff Shock}_{c2019} \times post_t + \delta_t + \delta_c \tag{11}$$

$$\log(\text{Immigrants inflow}_{ict}) = \beta \times \text{Tariff Shock}_{ic2019} \times post_t + \delta_{it} + \delta_{ct} \tag{12}$$

$$\log(\text{Immigrants inflow}_{rct}) = \beta \times \text{Tariff Shock}_{rc2019} \times post_t + \delta_t + \delta_r + \delta_c \tag{13}$$

Where post is indicator for the year 2019.

The results are reported above, inside the figures of the event study results . In addition, using wald tests I reject for the country (t=1.4) and country-industry (t=2.05) level event study models the one-sided null hypothesis of no positive gap between the post (2019) and

pre event (2014-2018) estimates. That is, the estimate post the tariff increases is significantly higher than any other earlier positive association.

5.3 Excluding Canada and Mexico

As the aim of this paper is to document a general link between trade policy and migration, it is important to verify that the estimated effect is not a result of a trend in a specific country. Namely, Canada and Mexico are border countries and were among the two nations with the highest tariffs increase (Fajgelbaum et al., 2019). Hence, I address this concern by excluding those countries from the country level and country-industry analysis. The event study results for that exercise are reported in the appendix, and are similar with respect to magnitude and significance to the results of the entire sample. Explicitly, the 2019 estimate is 0.133, compared to 0.14 for my main specification. For the country-industry level model, the estimates post the tariff increases are qualitatively consistent with the estimation with the entire sample - the estimate for 2018, is 5.88 and significant, indicating that the migration was not entirely lagged.

5.4 Exploiting the time variation in tariff increases: industry-country fixed effects

A different concern about my main specification is that country-industry constant factors shape the migration patterns before and after the tariff increases. To address this concern, I leverage the time variation in the tariff increases. That is, instead of estimating an event study framework with the 2019 cumulative increases as a continuous event, I estimate a pre-post regression where the 2018 and 2019 tariff increases differ. The fact that the tariffs began at 2018 and then increased at 2019 enable me to run:

$$\log(\text{Immigrants inflow}_{ict}) = \beta \times \text{Tariff Shock}_{ict} \times post_t + \delta_{it} + \delta_{ct} + \delta_{ic} \tag{14}$$

Where post is indicator for the years 2018 and 2019.

The point estimate of this model is 2.54 with a industry level clustering robust standard error of 1.61 (p.value 0.12)[6], which is similar and consistent with the results of the main estimate (2.51) that used time invariant shock measure (see appendix for the regression summary table).

[6]The p.value with standard se is 0.06. The additional fixed effects increase the variance of the estimate, but the estimate is similar in the magnitude of the country-industry level model

6 Model: Endogenous International Labor Mobility Approach

In order to understand the different economic forces which shape tariff-induced migration and quantify the welfare implications of international labor mobility on workers worldwide, I develop a multi country- multi industry general equilibrium Armington-Roy model. I base it on a simplified version of BHTV (2020) model, and endogenous labor (migration) in a unified framework as in Brinatti and Guo (2024). Its main innovation is the endogenous role of tariffs in shaping wages, prices, and following this – migration decisions. In this setting, tariffs act as endogenous unified force that shapes both labor supply (migration) and labor demand (through consumption and trade).

Namely, trade protection of US industries, result terms-of-trade effect which increases the relative wage between the US and other countries, and a tariff revenue increase. If this relative increase is higher than the tariff-induced inflation, foreigners would like to migrate to the US. In addition, the increased domestic demand through substitution effect, amplifies the incentive to migrate.

To be able to discuss the aggregate effects of the tariffs on US (and other countries') welfare, I add an aggregated non-traded sector as in Fajgelbaum and Khandelwal (2016) and Fajgelbaum et al. (2019). This way, the welfare analysis accounts for the fact that for many economies the largest expenditure share is non-tradable. As the role of the non-traded sector is to account for GE effects of trade shocks on non-traded demand and consumption, I assume for simplicity that only US born workers in the traded sectors get the tariff revenue rebates. Nevertheless, workers in the non-traded still benefit from tariff revenues through increased demand of their production by the workers in the traded sector. In the next paragraphs I proceed with the model formulation and estimation.

6.1 Setting: C countries and N industries trade model, with a non-traded sector

The model leverages the fact that different tariff levels were imposed both on different countries and different industries within a country. Although some of my empirical sections uses initial employment heterogeneity for regional analysis, the relevant exogenous shock is in the country-industry level, and hence I use this level of aggregation for the model.

Let C denote the set of migrant-source countries and $N+1$ the set of industries. For every

country $c \in C$ and industry n, there is a single representative agent (worker) c:n.

Production :

Production of country c and industry n good is one-to-one with labor[7]. Namely,

$$\forall c, n : Y_{cn} = L_{cn} \tag{15}$$

Hence optimal production yields,

$$\forall c, n : w_{cn} = p_{cn} \tag{16}$$

Consumption and labor demand:

Consumption is defined over two layers. First, each worker decides between tradable and non-tradable consumption using Coub-Douglas preferences:

$$U_{cn} = c_{cn}^{1-\alpha_c} \cdot c_{cNon-Tradable}^{\alpha_c} \tag{17}$$

Where α_c is the non-tradable expenditure share in country c

Next, for tradable consumption, each worker c:n has a CES preferences over all other countries and tradable industries (Armington, 1969) with elasticity of substitution parameter σ, CES price index over tradable goods in each country $P_c = (\sum_{n'c'} p_{n'c'}^{1-\sigma})^{\frac{1}{1-\sigma}}$, and aggregate price index in eac country $P_c^{1-\alpha_c} \cdot P_{c,NT}^{\alpha_c}$.

$$u_{cn} = \left(\sum_{c' \in \mathcal{C}} \sum_{n'=1}^{N} c_{c'n'}^{cn \frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{\sigma-1}} \tag{18}$$

Hence, traded demand takes the following form:

[7] As I solve the model in log changes, this assumption is without loss of generality compared to a model with heterogeneous country-industry level productivity, assuming that these productivities do not change substantially in two years.

The demand of US workers in industry $n' \neq NT$ for good c:n is given by:

$$\forall c,n : c_{c,n}^{US,n'} = \frac{(p_{cn} \cdot (1+\tau_{cn}^{US}))^{-\sigma}}{(P_{US})^{1-\sigma}}(1-\alpha_c)(w_{US,n'}L_{US,n'} + \frac{\Sigma_{n''}\Sigma_{c''\neq US}\Sigma_{n^{US}}\tau_{c''n''}p_{c''n''}c_{c''n''}^{US,n^{US}}}{\Sigma_{n''\neq NT}L_{USn''}^{0}}L_{US,n'}^{0}) \tag{19}$$

Where the income of US born workers consists of wage and tariff rebates, and for $n' = NT$ the demand takes the same structure but with no rebates.

The demand of c':n' workers for good c:n is given by

$$\forall c,n : c_{c,n}^{c',n'} = \frac{p_{cn}^{-\sigma}}{P_{c'}^{1-\sigma}}(1-\alpha_{c'})w_{c',n'}L_{c',n'} \tag{20}$$

And if this worker migrates to the US:

$$\forall c,n : c_{c,n}^{c'\to US,n'} = \frac{p_{cn}^{-\sigma}}{P_{US}^{1-\sigma}}(1-\alpha_{US})w_{US,n'}L_{c'\to US,n'} \tag{21}$$

Hence, the global demand for good n of country c is given by:

$$L_{cn}^{d} = y_{cn} = \Sigma_{c'}\Sigma_{n'}c_{cn}^{c'n'} =$$

$$\Sigma_{n'}[\Sigma_{c'}\frac{p_{cn}^{-\sigma}}{P_{c'}^{1-\sigma}}p_{c',n'}L_{c',n'} + \frac{[p_{cn}\times(1+\tau_{cn})]^{-\sigma}}{P_{US}(\tau)^{1-\sigma}}(1-\alpha_{c'})(p_{US,n'}L_{US,n'} + \frac{\Sigma_{n''}\Sigma_{c''\neq US}\Sigma_{n^{US}}\tau_{c''n''}p_{c''n''}c_{c''n''}^{US,n^{US}}}{\Sigma_{n''}L_{USn''}}L_{US,n'}^{0})] \tag{22}$$

Labor supply:

Foreign workers can supply labor in their origin or the US only.

Hence, assuming Gumbell taste-shock distribution with variance parameter θ, the share of workers from c:n which choose to live in the US is given by:

$$\pi_{cn}^{US} = \frac{\left(\frac{w_{USn}}{P_{US}^{1-\alpha_{US}}\cdot P_{US,NT}^{\alpha_{US}}}\right)^{\theta}}{\left(\frac{w_{USn}}{P_{US}^{1-\alpha_{US}}\cdot P_{US,NT}^{\alpha_{US}}}\right)^{\theta} + \left(\frac{w_{cn}}{P_{c}^{1-\alpha_{c}}\cdot P_{c,NT}^{\alpha_{c}}}\right)^{\theta}} = \frac{1}{1+\left(\frac{w_{cn}}{w_{USn}}\cdot\frac{P_{US}^{1-\alpha_{US}}\cdot P_{US,NT}^{\alpha_{US}}}{P_{c}^{1-\alpha_{c}}\cdot P_{c,NT}^{\alpha_{c}}}\right)^{\theta}} \tag{23}$$

So, the labor supply of migrants from c:n in their origin country c is:

$$L^s_{cn} = (1 - \pi^{US}_{cn})(L^0_{cn}) \tag{24}$$

Hence, in changes $\hat{L^s_{cn}} = -(1 - \hat{\pi}^{US}_{cn})$ (as migration is only between the US and a given country, the sum of their population is always fixed)

In addition, the labor supply in the US is given by:

$$L^s_{USn} = L^0_{USn} + \Sigma_{c''} \pi^{US}_{c''n} L^0_{c''n} \tag{25}$$

6.2 Equilibrium

The equilibrium for this economy is defined by a set of prices p_{cn}, which combined with the initial labor endorsements L^0_{cn} pin down labor allocations L_{cn} across countries for each industry n. The non-traded equilibrium wage and consumption is entirely pinned down by the traded industries outcomes. I proceed by solving the trade general equilibrium block, following the non-traded equilibrium. Namely, the equilibrium is defined by the following conditions:

Traded Industries

Labor Demand: Goods markets clear In equilibrium the goods markets c:n have to clear for any country and industry pair. Namely, the induced labor demand for good c:n has to equal the labor supply of workers c:n.

$$\forall c, n : y_{cn} = L_{cn} = \Sigma_{c'} \Sigma_{n'} c^{c'n'}_{cn} = \Sigma_{c'} \Sigma_{n'} \lambda^{c'n'}_{cn} E_{c'n'} \tag{26}$$

$$\lambda^{c'n'}_{cn} = (1 - \alpha_{c'}) \frac{p^{-\sigma}_{cn}}{P^{1-\sigma}_c}, \quad \lambda^{USn'}_{cn} = (1 - \alpha_{US}) \frac{(p_{cn} \cdot (1 + \tau_{cn}))^{-\sigma}}{P^{1-\sigma}_c} \tag{27}$$

$$E_{c'n'} = p_{c'n'} L_{c'n'} \quad E_{USn'} = p_{USn'} L_{USn'} + R L^0_{USn'} \tag{28}$$

Where R is the value of tariff rebates per US-born worker and is equal to zero for all other groups.

Labor Supply is optimal

$$L_{cn} = \begin{cases} \pi^{c}_{cn} L^{0}_{cn} = \dfrac{\left(\frac{p_{cn}}{P_c^{1-\alpha_c} \cdot P_{c,NT}^{\alpha_c}}\right)^{\theta}}{\left(\frac{p_{USn}}{P_{US}^{1-\alpha_{US}} \cdot P_{US,NT}^{\alpha_{US}}}\right)^{\theta} + \left(\frac{p_{cn}}{P_c^{1-\alpha_c} \cdot P_{c,NT}^{\alpha_c}}\right)^{\theta}}, & \text{if } c \neq US \\ L^{0}_{USn} + \Sigma_{c''} \pi^{US}_{c''n} L^{0}_{c''n} & \text{if } c = US \end{cases} \tag{29}$$

Where $\pi^{US}_{cn} = 1 - \pi^{c}_{cn}$

Global labor markets clear

$$\Sigma_c L_{cn} = L^{0}_{n} \tag{30}$$

Non-traded sector The market clearing for the non-traded sector in each country c is given by:

$$p_{NT} \Sigma_{n'} c^{n',c}_{NT,c} = \alpha_c \Sigma_{n'} E_{cn'} = p_{NT} y_{NT} \tag{31}$$

In addition, for worker type $n = NT$ in c:

$$E_{NTc} = w_{c,NT} L_{c,NT} = p_{c,NT} y_{c,NT} \tag{32}$$

Hence,

$$p_{c,NT} L_{c,NT} = w_{c,NT} L_{c,NT} = \frac{1}{1-\alpha_c} \Sigma_{n' \neq NT} E_{c,n'} \tag{33}$$

6.3 Log-linearized Equilibrium Conditions

The key system of equations of the model is the equilibrium conditions of the tradable block, for changes in the labor markets. In each market $c:n$, the change in labor demand equals the change in labor supply.

Non-traded Sector As the stock of workers in the non-tradable sector assumed to be fixed $\hat{L}^{S}_{cNT} = 0$, the log-linearized change of wage in this sector is given by:

$$\hat{p}_{NT,c\neq US} = \Sigma_{n'\neq NT} \frac{w_{n'c} L_{n'c}}{\Sigma_{n''} w_{n''c} L_{n''c}} (\hat{p}_{n'c} + \hat{L}_{n'c}) \tag{34}$$

$$\hat{p}_{NT,US} = \Sigma_{n'\neq NT} \frac{(w_{n'US} + R) L_{n'US}}{\Sigma_{n''} (w_{n''US} + R) L_{n''US}} (\delta^W_{n'} (\hat{p}_{n'US} + \hat{L}_{n'US}) + \delta^R_{n'} \hat{R}) \tag{35}$$

Traded Industries That is $\forall c, n \neq NT$:

$$\hat{L}^{Supply}_{cn} = \hat{L}^{Demand}_{cn} \tag{36}$$

Where the log change of the price index is given by $\widehat{P}^{Aggregated}_c = (1-\alpha_c)\hat{P}_c + \alpha_c \hat{w}_{NT,c}$:

$$\hat{L}^{Supply}_{cn} = \begin{cases} \pi^{US}_{cn} \cdot \theta \cdot \left[(\hat{p}_{cn} - \widehat{P}^{Aggregated}_c) - (\hat{p}_{USn} - \widehat{P}^{Aggregated}_{US}) \right], & \text{if } c \neq US \\ s^{USMIGLF}_n \Sigma_{c'\neq US} s^{nMIGLFfromc'}_{c'n} \pi^{US}_{c'n} \cdot \widehat{(-L_{c'n})}, & \text{if } c = US \end{cases} \tag{37}$$

$$\begin{aligned} \hat{L}^{\text{Demand}}_{cn} = & \sum_{n'\cup NT} \sum_{c'\neq US} s^{c'n'}_{cn} \left[-\sigma \hat{p}_{cn} - (1-\sigma)\hat{P}_{c'} + \hat{p}_{c'n'} + \hat{L}_{c'n'} \right] \\ & + \sum_{n'\cup NT} s^{USn'}_{cn} \left[-\sigma \hat{p}_{cn} - \sigma(\widehat{1+\tau_{cn}}) - (1-\sigma)\hat{P}_{US} + \delta^W_{US,n'} \left(\hat{p}_{USn'} + \hat{L}_{USn'} \right) + \delta^T_{US,n'} \hat{T} \right] \end{aligned} \tag{38}$$

$$\begin{aligned} & \hat{T} = \\ & \left[\Sigma_{n^{US}} \Sigma_{c\neq US} \Sigma_n \omega_{n^{US},c,n} (\hat{\tau}_{cn} + \hat{p}_{cn} + \delta^W_{US,n^{US}} (\hat{p}_{US,n^{US}} + \hat{L}_{US,n^{US}}) - \sigma(\hat{p}_{cn} + \widehat{1+\tau_{cn}}) - (1-\sigma)\hat{P}_{US}) \right] \cdot K \end{aligned} \tag{39}$$

$$K = \left[1 - \Sigma_{n^{US}} \Sigma_{c\neq US} \Sigma_n \omega_{n^{US},c,n} \frac{\frac{TL_{n^{US}}}{\Sigma_{n^{US\prime}} L_{n^{US\prime}}}}{E_{US,n^{US}}} \right]^{-1} \tag{40}$$

Where $s^{c'n'}_{cn} = \frac{\lambda^{c'n'}_{cn} E_{c'n'}}{L_{cn}}$ is the initial real expenditure of worker c':n' on industry c:n as a share of the global real expenditure, and π^{US}_{cn} is the initial migration to the US of workers c:n, as a share of the total labor supply of industry n in country c, $\omega^{n^{US}}_{c,n} = \frac{\tau_{cn} p_{cn} c^{US,n^{US}}_{cn}}{T}$ is the

country-industry level tariff revenue from US worker n^{US} as a share of total tariff revenues, $\delta^{I}_{US,n} = \frac{w_{USn}L_{USn}}{w_{USn}L_{USn}+RL^{0}_{USn}}$ is the wage income share, $\delta^{T}_{US,n}$ is the tariff revenue income share, $s^{MIGLFfromcn}_{c'n}$ is the initial origin level migrants share in industry level migrants labor force, $s^{USMIGLF}_{n}$ is the initial migrants share in industry level labor force.

7 Estimation and counterfactual analysis

7.1 Calibration

In GE the labor mobility of workers, wages, and prices, are all determined endogenously following tariffs increase. Namely, positive real wage differences between the US and any other country, which may arise due to terms-of-trade effect, yield positive demand shock to the US local labor market and a negative (relative) shock to the other countries. This is the first pushing force to the US. Secondly, workers are characterized by a sensitivity for the tariff increases and their willingness to move even following changes in the real wages. This force is captured by the elasticity of migration θ.

The ability to estimate those parameters for different countries and industries is feasible due to the model's country-industry dimensionality and the UNIDO database. Explicitly, this dataset includes for dozens of UN members the number of employees, wages per employee, and output in country-industry level. I use this data source alongside ACS data and datasets from previous literature to calibrate the initial shares and parameters to solve the model in log changes. Table 5 summaries the calibration procedure.

Table 5: Calibrated Parameters

Parameter		Value	Source
Demand: Elasticity of substitution	σ	4	Feenstra (2018), Broda and Weinstein (2006)
Supply: Elasticity of International Migration	θ	1.18	Indirect Inference
Income shares	$s^{c'n'}_{cn}$	0-1	UNIDO
Initial Migrants Share	π^{US}_{cn}	0-1	UNIDO, ACS
Initial Migrants share in industry level labor force	$s^{USMIGLF}_{n}$	0-1	ACS
Initial origin level Migrants share in industry level migrants labor force	$s^{MIGLFfromcn}_{c'n}$	0-1	ACS
Cumulative tariff shocks	$\hat{\tau}^{US}_{cn}$	0-1	Fajglebaum et al. (2019)
Good's c,n tariff revenue from US worker n^{US} as a share of total tariff revenues	$\omega^{n^{US}}_{c,n}$	0-1	ACS, Fajglebaum et al. (2019)
Non-traded expenditure share	α_c	0-1	Services share or GDP, World Bank

7.2 Calibration of the migration elasticity

I follow several approaches to calibrate my baseline value of θ. First, the model induces equations that correspond to an indirect inference approach. I estimate θ this way, based on a first stage of the link between tariffs and wages, and a reduced form of the link between

tariffs and migration flows. I also estimate Anderson and Rubin (1949) confidence intervals. The 2sls estimation identifies $\theta = 1.18^{***}$ with AR CI of [0.3906, 1.7744] with p.value = 0.0005. Nevertheless, solving the model with different values of θ is a key. Namely, when $\theta = 0$, the model corresponds to the main counterfactual of this paper, with no labor mobility channel. Next, in the baseline value of 1.18, it corresponds to similar estimates of migrants mobility from the literature which find a median elasticity of 1.63 (Head and Mayer, 2021). Finally, I present the welfare implications of the $\theta = 1.18 \cdot 3$, when labor mobility is very responsive to real wage gaps.

To identify θ using indirect inference , I proceed as follows:

Note that, from the model we have the following accounting identity where m_{cn} is the number of c:n workers who choose to move to the US (inflow from c to the US):

$$m_{cn} = \pi_{cn}^{US} L_{cn}^0 = (1 - \pi_{cn}^c) L_{cn}^0 = L_{cn}^0 - \pi_{cn}^c L_{cn}^0 \rightarrow \pi_{cn}^c = \frac{L_{cn}^0 - m_{cn}}{L_{cn}^0} \tag{41}$$

Hence,

$$\hat{\pi}_{cn} = \frac{\widehat{L_{cn}^0 - m_{cn}}}{L_{cn}^0} = \widehat{L_{cn}^0 - m_{cn}} - \hat{L}_{cn}^0 = \frac{-m_{cn}}{L_{cn}^0 - m_{cn}} \hat{m}_{cn} + \frac{L_{cn}^0}{L_{cn}^0 - m_{cn}} \hat{L}_{cn}^0 + 0 = \frac{-m_{cn}}{L_{cn}^0 - m_{cn}} \hat{m}_{cn}$$
$$\approx \frac{-m_{cn}}{L_{cn}^0} \hat{m}_{cn} = -\pi_{cn}^{US,2017} \hat{m}_{cn} \tag{42}$$

And, $\hat{\pi}_{cn}$ is derived from the model as:

$$\pi_{cn}^{US,2017} \cdot \theta \cdot \left[\hat{p}_{cn} - \hat{p}_{USn} + \widehat{P}_{US}^{Aggregated} - \widehat{P}_c^{Aggregated} \right] \tag{43}$$

Hence, we have:

$$d\log(m_{cn}) = -\theta \cdot \left[d\log(p_{cn}) - d\log(p_{USn}) + d\log(P_{US}^{Aggregated}) - d\log(P_c^{Aggregated}) \right] \tag{44}$$

Equating those equations, I construct the 2sls estimate and AR (1949) CI.

First stage:

I leverage the industry-country level shock exposure to instrument the log difference in wages. That is, my first stage is defined over the outcome, $\log(w_{ict}) - \log(w_{ic2017})$, where $t \in 2018, 2019$. Using this outcome I estimated:

$$\log(w_{ict}) - \log(w_{ic2017}) = \beta_t \text{Tariff Shock}_{ic2019} + \delta_{it} + \delta_{ct} \tag{45}$$

That is, this regression uses within industry-country variation over time, in order to identify the elasticity of real wage differences with respect to a country-industry tariff increase.

Second Stage:

$$\log(\text{Immigrants Inflow}_{ict}) - \log(\text{Immigrants Inflow}_{ic2017}) = \theta \cdot (\log(w_{ict}) - \log(w_{ic2017})) + \delta_{it} + \delta_{ct} \tag{46}$$

This regression captures the structure of the model induced relationship in equation 44. Tables 6 and 7 report the estimation results.

Table 6: IV Estimates: First and Second Stage

Panel A: First stage Dep. Var.: $\log(wage_{ict}) - \log(wage_{ic2017})$				
Regressor	Estimate	Std. Error	t value	$\Pr(>\|t\|)$
$\text{Tariff Shock}_{ci2019}$	3.25	0.56	5.83	8.077e-05***

Panel B: Second stage Dep. Var.: $\log(\text{Immigrant Inflow}_{ict}) - \log(\text{Immigrant Inflow}_{ic2017})$				
Regressor	Estimate	Std. Error	t value	$\Pr(>\|t\|)$
$\log(wage_{ict}) - \log(wage_{ic2017})^{FITTED}$	1.189	0.515	2.3	0.039*

Obs. = 67; Weights = `immg_flow_2017`; FE: `factor(bpl_year)`, `factor(naics_3_year)`;
SE: Clustered by `naics_3`;
First-stage F (for endog. regressor) $F(1, 48) = 18.3$, $p = 8.911 \times 10^{-5}$;
Wu–Hausman: $F(1, 24) = 10.8$, $p = 0.003062$.

Endogenous variable: $\log(wage_{ict}) - \log(wage_{ic2017})$. Instrument: $\text{TariffShock}_{ci2019}$.
Signif.: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, . $p < 0.1$.

Table 7: AR (1949) 95% CI

Dependent variable:	$\log(\textit{Immigrant Inflow}_{ict}) - \log(\textit{Immigrant Inflow}_{ic2017})$
θ	$[0.39, 1.77]^{***}$
Industry-time FE	YES
Origin-time FE	YES
Observations	67
F(2,64)= 8.6177	

Note: $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$, SE clustered by industry

Given the 2sls baseline value of $\theta = 1.18$, and all other calibrated parameters, I proceed and solve the price changes in general equilibrium using the system of equations in (29)-(31), following the observed tariff shocks.

7.3 Welfare changes of US workers

The welfare of US workers (weighted sum of real wage changes and tariff revenues change, by initial GDP share of a given worker type) increased by 0.17%. Table 8 includes the equilibrium welfare changes of US workers following the 2019 tariffs with labor mobility. The results characterize the manufacturing and extraction of energy producing products, manufacture of machinery and equipment products, manufacturing of chemicals and non–metallic mineral products, and manufacturing of computer, electronic and optical products as industries (worker types) that benefited from the tariffs. Namely, these industries (workers) increased their welfare by 3.1%, 2.6%, 1.4%, 0.7%. Finally, the non-traded sector which accounts for the highest share of GDP, experienced a modest 0.2% welfare increase.

Table 8: US Welfare Changes (real income: wages + revenues)

Economic activity	$\delta^W \widehat{\frac{w_{nUS}}{P^{Aggregated}_{US}}} + \delta^T \widehat{\frac{T}{P^{Aggregated}_{US}}}$
Mining and extraction of energy producing products	0.031
Manufacture of machinery and equipment n.e.c.	0.026
Manufacture of chemicals and non–metallic mineral products	0.014
Manufacture of computer, electronic and optical products	0.007
Non-traded sector	**0.002**
Manufacture of motor vehicles, trailers, semi–trailers and of other transport equipment	-0.000
Manufacture of fabricated metal products, except machinery and equipment	-0.003
Manufacture of food products	-0.003
Manufacture of wearing apparel	-0.007
Manufacture of rubber and plastics products	-0.007
Manufacture of leather and related products	-0.008
Manufacture of furniture; jewellery, musical instruments, toys, etc.; repair and installation of machinery and equipment	-0.008
Manufacture of basic metals	-0.008
Manufacture of textiles	-0.008
Manufacture of electrical equipment	-0.008
Manufacture of paper and paper products	-0.008
Manufacture of other non–metallic mineral products	-0.009
Printing and reproduction of recorded media	-0.009
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	-0.010

Lastly, it is important to note that when tariffs are imposed, more migrants may choose to move to the US relatively to groups with lower exposure to tariffs, even if the welfare in the US decreases. This is true, as the migration force is based on the changes in welfare differences between the US and a given country. The reason behind this labor supply side explanation is that the US industries are not targeted with tariffs, and international industries are. US industries may experience lower demand due to international income effect. At the same time, foreign industries experience the income effect, and a substitution effect out of their production as a result of tariffs. Hence, the foreign industries experience a relatively higher negative effect for the demand of their production, compared to the US ones. Finally, note that the magnitude of these changes increases with the tariff shock magnitude, and hence creates relational outcomes that are linked to the shock level magnitude.

To illustrate this point, I include figure 6 which plots the average change in the real wage gap between the US and a given country, as function of the average tariff shock on this industry (across different countries). There is a clear relative trend between higher tariffs and higher real wage gap change in equilibrium, exactly like the reduced form event study models capture.

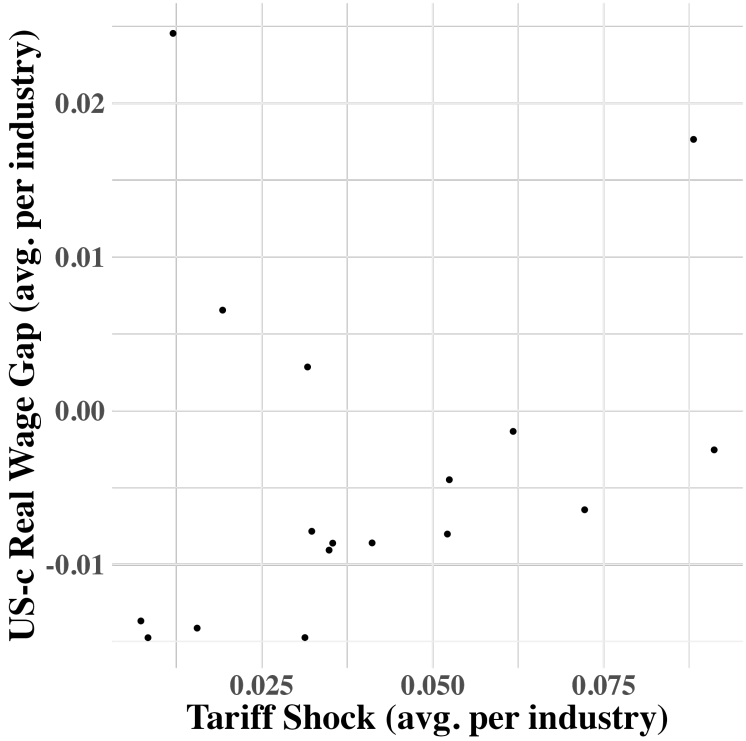


Figure 6: Cross-country Real Wage Gaps Changes as Function of Average Tariff Shock

7.4 Average Welfare Changes: Foreign Workers

The welfare of foreign workers decreased by 0.18%, and features a distributional variation as well. Welfare losses characterize workers in industries which were intensively targeted with tariffs: metal related industries, and and motor vehicles manufacturing.

Table 9: Foreigners' Welfare changes by Economic Activity

Economic activity	$\frac{\widehat{w_{ic}}}{P_c^{Aggregated}}$
Manufacture of basic metals	-0.005
Manufacture of other non–metallic mineral products	-0.004
Manufacture of fabricated metal products, except machinery and equipment	-0.004
Manufacture of electrical equipment	-0.004
Manufacture of food products	-0.003
Manufacture of furniture; jewellery, musical instruments, toys, etc.; repair and installation of machinery and equipment	-0.003
Manufacture of paper and paper products	-0.003
Manufacture of rubber and plastics products	-0.003
Manufacture of motor vehicles, trailers, semi–trailers and of other transport equipment	-0.002
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	-0.000
Non-traded sector	**0.000**
Manufacture of wearing apparel	0.001
Manufacture of textiles	0.001
Manufacture of computer, electronic and optical products	0.002
Printing and reproduction of recorded media	0.002
Manufacture of leather and related products	0.002
Manufacture of chemicals and non–metallic mineral products	0.005
Mining and extraction of energy producing products	0.005
Manufacture of machinery and equipment n.e.c.	0.006

7.5 Estimated Change of Terms of Trade ($\hat{p}_{cn} - \hat{p}_{USn}$)

The associated GE price (or wage) changes reflect global trade adjustments and terms-of-trade effect. Namely, the tariffs lead to decreased global demand from all industries and countries relatively to the US. This leads to a negative labor demand shock for any country c and industry i. To offset the tariffs shock in GE, the real wages (where nominal wages are equal to prices) have to decrease. Even the US, which do not impose tariffs on itself, is still affected by lower international demand for its products which again translate to price reduction. The results reveal these terms-of-trade improvements, which the US enjoys in every industry. Explicitly, the US is estimated to have an average of 1.2% (and a median of 0.83%) relatively higher wage gap compared to the initial state.

China and Canada experienced relatively higher terms-of-trade loss, as the average gap between the US price (or wage) and their price (wage) in a given industry increased by 2.5% and 1.9%, respectively.

Country	$\hat{w}_{ic} - \hat{w}_{iUS}$	Country	$\hat{w}_{ic} - \hat{w}_{iUS}$
HUN	-0.030	ESP	-0.011
CHN	-0.025	SWE	-0.011
PRT	-0.023	FRA	-0.010
ARE	-0.023	IND	-0.010
BGR	-0.020	VNM	-0.009
MYS	-0.019	LAO	-0.009
CAN	-0.019	JOR	-0.009
IDN	-0.019	DNK	-0.008
AUT	-0.017	ISR	-0.008
TUR	-0.016	BEL	-0.007
SAU	-0.016	SYR	-0.007
JPN	-0.015	DEU	-0.006
POL	-0.015	IRL	-0.006
MEX	-0.014	GRC	-0.006
ROU	-0.014	IRQ	-0.006
RUS	-0.013	KOR	-0.005
AUS	-0.013	NLD	-0.005
FIN	-0.013	ALB	-0.005
ITA	-0.012	CHE	-0.005
PHL	-0.011		

Moreover, industries with high American international expenditure and relatively high tariffs experienced higher positive changes. The industries with highest term-of-trade changes are mainly metal related industries.

Table 10: Average ToT by Economic Activity

Economic activity	$\hat{w}_{ic} - \hat{w}_{iUS}$
Mining and extraction of energy producing products	-0.040
Manufacture of machinery and equipment n.e.c.	-0.030
Manufacture of chemicals and non–metallic mineral products	-0.020
Manufacture of computer, electronic and optical products	-0.016
Manufacture of motor vehicles, trailers, semi–trailers and of other transport equipment	-0.013
Manufacture of fabricated metal products, except machinery and equipment	-0.013
Manufacture of food products	-0.010
Manufacture of basic metals	-0.010
Manufacture of paper and paper products	-0.007
Manufacture of electrical equipment	-0.006
Manufacture of furniture; jewellery, musical instruments, toys, etc.; repair and installation of machinery and equipment	-0.006
Manufacture of rubber and plastics products	-0.006
Manufacture of other non–metallic mineral products	-0.005
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	-0.002
Manufacture of wearing apparel	-0.002
Printing and reproduction of recorded media	-0.001
Manufacture of textiles	-0.001
Manufacture of leather and related products	-0.001

7.6 Counterfactual Analysis: the role of the labor mobility channel

Next, I proceed with the main quantitative exercise of this paper, which is to estimate the effect of international labor mobility on welfare of US and foreign workers. Accordingly, the following counterfactual of this paper shuts down international migration of workers to the US, or explicitly - sets $\forall c, n : \hat{L^s_{cn}} = 0$. In this environment, each country produces according to its initial stock of labor in each industry, and love of variety motive of CES preferences lead to international trade.

I solve for the counterfactual price changes in GE following the observed tariff shocks, and calculate the changes of real wages for American and foreign workers in a counterfactual with no labor mobility. The weighted welfare change of US workers increases from 0.17% to 0.41%, and foreigners' one decreases from -0.18% to -0.27%. Namely, following the observed tariff shocks, the welfare change of US workers in the computer manufacturing industry is 8.6% higher with no labor mobility. In addition, the welfare change of chemicals manufacturing workers increases by 2.6%. Other industries experience a lower positive welfare change between the two scenarios or a welfare decrease due to higher price index without labor mobility.

Table 11: The difference in real wage without labor mobility

Economic activity	$\hat{W}_{US}^{NoLaborMobility} - \hat{W}_{US}^{LaborMobility}$
Manufacture of computer, electronic and optical products	0.086
Manufacture of chemicals and non–metallic mineral products	0.026
Non-traded sector	**0.002**
Manufacture of fabricated metal products, except machinery and equipment	-0.004
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	-0.007
Manufacture of furniture; jewellery, musical instruments, toys, etc.; repair and installation of machinery and equipment	-0.008
Manufacture of leather and related products	-0.009
Manufacture of textiles	-0.009
Manufacture of wearing apparel	-0.009
Printing and reproduction of recorded media	-0.009
Manufacture of food products	-0.009
Manufacture of other non–metallic mineral products	-0.009
Manufacture of rubber and plastics products	-0.010
Manufacture of basic metals	-0.010
Manufacture of paper and paper products	-0.010
Manufacture of electrical equipment	-0.010
Manufacture of motor vehicles, trailers, semi–trailers and of other transport equipment	-0.011
Manufacture of machinery and equipment n.e.c.	-0.031
Mining and extraction of energy producing products	-0.050

To fully characterize how labor mobility shapes welfare changes, I run an additional counterfactual with amplified labor mobility channel. Specifically, I solve the model in log changes with tripled elasticity of mobility θ relatively to the baseline estimate. Figure 7 illustrates the welfare changes for US worker and workers worldwide as function of θ.

The labor mobility channel plays an important role for welfare. Without labor mobility, following tariff increases, the welfare of US workers in the targeted manufacturing industries (without retaliation) goes up by additional 0.24%, and foreigners' decrease by 0.09%, which are high shares of the welfare changes following the observed tariffs shock.

Interestingly, introduction of the labor mobility channel monotonically decreases the welfare changes gap between the US and foreign countries. This characteristic of the equilibrium illustrates how the labor mobility channel serves as a force that equates the welfare impact of tariff shocks between countries. The same force was explored by Mundell (1961) with respect to labor mobility in regions with mutual currency, instead of currency fluctuations which results from different demand shocks. Lastly, as foreign workers constitute a significantly larger share of the global labor force compared to the US, the labor mobility channel enhances global welfare.

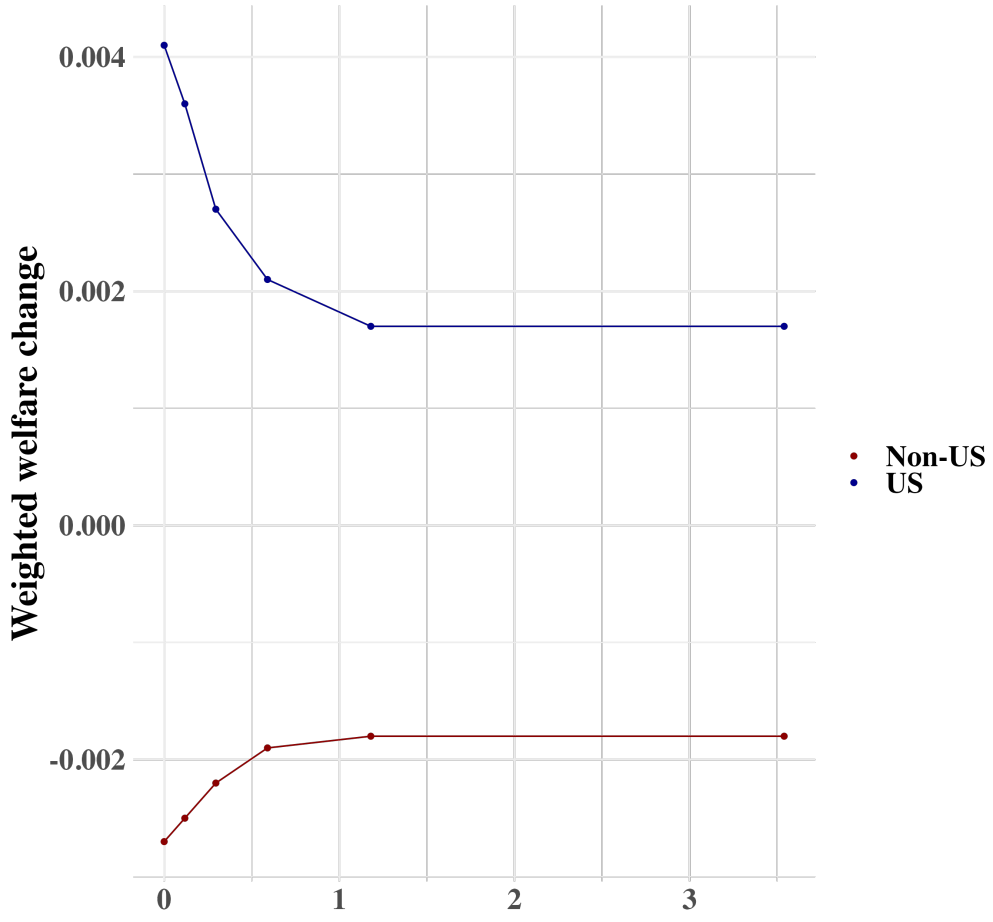


Figure 7: Welfare Changes as function of θ

8 Conclusion

This paper documents the existence of an international labor mobility channel from economies worldwide, following changes to trade policies. Moreover, I explore its importance for welfare, and show that it mitigates the welfare effects of tariffs. Motivated by the duality between free trade with inputs immobility, and restricted trade with inputs mobility by Mundell (1957), and the role of wages in optimal choice of residence as in Roback (1982), I explore how tariffs shape foreign labor immigration to the US.

In the first part of the paper, I estimate reduced form event study models which confirm three facts. First, I show that more migrants come to the US from countries that are more exposed to tariff increases. Second, more migrants come from more exposed industries within an origin country. Finally, they move to US commuting zones with higher exposure to the increase. Those increased flows are reflected in an analysis of firm level data about permanent work authorizations. The results of this analysis show how US firms increased sourcing from more exposed industry-country pairs.

To understand the welfare implications of such trade and migration changes, I develop an Armington style multi industry-multi country model of trade with endogenous labor supply. The estimation of this model features indirect inference of international migration elasticity which aligns with the relevant literature, and general equilibrium price (wage) changes following trade barrier shocks (tariff increases) with endogenous labor mobility. The tariffs induced a terms-of-trade improvement to the US, and modest welfare increase with distributional heterogeneity. Finally, I show in a counterfactual analysis that labor mobility mitigates large share of the tariff induced welfare changes. In that sense, the labor mobility channel operates as a welfare-equating force for the trade shocks, similarly to this channel in currency unions settings (Mundell, 1961). Future research could explore the demographic heterogeneity of treated migrant groups, the relationship of other international shocks to labor mobility, and labor market structure implications.

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Trade and Labor Mobility: The Effect of Increased Tariffs on Immigration

Online Appendix

Tom Basin

This appendix provides additional material supporting the main text. It is organized in two parts:

Part A: Theory Appendix and Proofs

- **Log-linearization of the Equilibrium**
- **Log–linearization of the tariff revenues**
- **Model induced reduced form motivation**
- **What shapes labor mobility and real wage differences?**

Part B: Empirical Appendix

- **Population Placebo Event Study**
- **Exploiting the time variation of tariffs to include industry-country FE**
- **Event Study models excluding Mexico and Canada**
- **Timing Placebo**

The next page begins Part A: Theory Appendix and Proofs.

9 Appendix A: Theory and Proofs

Log-linearization of the Equilibrium

Recall that the equilibrium conditions are:

$$\forall c, n : y_{cn} = L_{cn} = \Sigma_{c'}\Sigma_{n'} c_{cn}^{c'n'} = \Sigma_{c'}\Sigma_{n'} \lambda_{cn}^{c'n'} E_{c'n'} \tag{47}$$

$$\lambda_{cn}^{c'n'} = (1-\alpha_{c'}) \frac{(p_{cn} \cdot (1+\tau_{cn}))^{-\sigma}}{P_{c'}^{1-\sigma}} \tag{48}$$

$$E_{c'n'} = p_{c'n'} L_{c'n'} + R L_{c'n'}^0 \tag{49}$$

$$R = \frac{\Sigma_{n''}\Sigma_{c'' \neq US}\Sigma_{n^{US}} \tau_{c''n''} p_{c''n''} c_{c''n''}^{US,n^{US}}}{\Sigma_{n''} L_{USn''}^0} \tag{50}$$

Where R is the value of tariff rebates per US-born worker.

$$L_{cn} = \begin{cases} \pi_{cn}^c L_{cn}^0 = \frac{(\frac{p_{cn}}{P_c^{1-\alpha_c} P_{c,NT}^{\alpha_c}})^\theta}{(\frac{p_{cn}}{P_c^{1-\alpha_c} P_{c,NT}^{\alpha_c}})^\theta + (\frac{p_{USn}}{P_{US}^{1-\alpha_{US}} P_{US,NT}^{\alpha_{US}}})^\theta} L_{cn}^0, & \text{if } c \neq US \\ L_{USn}^0 + \Sigma_{c''} \pi_{c''n}^{US} L_{c''n}^0 & \text{if } c = US \end{cases} \tag{51}$$

Where $\pi_{cn}^{US} = 1 - \pi_{cn}^c$

Hence, $\forall c \neq US, n \in N$ **we have:**

$$\frac{(\frac{p_{cn}}{P_c^{1-\alpha_c} P_{c,NT}^{\alpha_c}})^\theta}{(\frac{p_{cn}}{P_c^{1-\alpha_c} P_{c,NT}^{\alpha_c}})^\theta + (\frac{p_{USn}}{P_{US}^{1-\alpha_{US}} P_{US,NT}^{\alpha_{US}}})^\theta} L_{cn}^0 = \Sigma_{c'}\Sigma_{n'} \frac{(p_{cn} \cdot (1+\tau_{cn}))^{-\sigma}}{P_c^{1-\sigma}} (p_{c'n'} L_{c'n'} + R L_{c'n'}^0) \tag{52}$$

Let's proceed to log-linearize those equlibrium conditions.

Left Hand Side:

$$\widehat{L_{cn}^{\text{Supply}}} = \frac{\widehat{(\frac{p_{cn}}{P_c^{1-\alpha_c} P_{c,NT}^{\alpha_c}})^{\theta}}}{(\frac{p_{cn}}{P_c^{1-\alpha_c} P_{c,NT}^{\alpha_c}})^{\theta} + (\frac{p_{US\,n}}{P_{US}^{1-\alpha_{US}} P_{US,NT}^{\alpha_{US}}})^{\theta}} = \frac{\widehat{1}}{1 + \left(\frac{p_{US\,n}}{p_{cn}} \frac{P_c^{1-\alpha_c} P_{c,NT}^{\alpha_c}}{P_{US}^{1-\alpha_{US}} P_{US,NT}^{\alpha_{US}}}\right)^{\theta}} = \tag{53}$$

$$\frac{\left(\frac{p_{US\,n}}{p_{cn}} \frac{P_c^{1-\alpha_c} P_{c,NT}^{\alpha_c}}{P_{US}^{1-\alpha_{US}} P_{US,NT}^{\alpha_{US}}}\right)^{\theta}}{1 + \left(\frac{p_{US\,n}}{p_{cn}} \frac{P_c^{1-\alpha_c} P_{c,NT}^{\alpha_c}}{P_{US}^{1-\alpha_{US}} P_{US,NT}^{\alpha_{US}}}\right)^{\theta}} \theta \left[\widehat{p_{cn}} - \widehat{p_{US\,n}} - (1-\alpha_c)\widehat{P_c} - \alpha_c \widehat{P_{c,NT}} + (1-\alpha_{US})\widehat{P_{US}} + \alpha_{US}\widehat{P_{US,NT}}\right] \tag{54}$$

And for $c = US$, $\forall n$:

$$\widehat{L_{USn}^{Supply}} = (L_{USn}^0 + \widehat{\Sigma_{c''} \pi_{c''n}^{US} L_{c''n}^0}) = \frac{\Sigma_{c''} \pi_{c''n}^{US} L_{c''n}^0}{L_{USn}^0 + \Sigma_{c''} \pi_{c''n}^{US} L_{c''n}^0} (\Sigma_{c''} \widehat{\pi_{c''n}^{US} L_{c''n}^0}) = \tag{55}$$

$$\frac{\Sigma_{c''} \pi_{c''n}^{US} L_{c''n}^0}{L_{USn}^0 + \Sigma_{c''} \pi_{c''n}^{US} L_{c''n}^0} (\Sigma_{c''} \frac{\pi_{c''n}^{US} L_{c''n}^0}{\Sigma_{c*} \pi_{c*n}^{US} L_{c*n}^0} \widehat{\pi}_{c''n}^{US})$$

Right Hand Side:

$$\begin{aligned} \widehat{L}_{cn}^{Demand} &= (\Sigma_{c'} \widehat{\Sigma_{n'} \lambda_{cn}^{c'n'} E_{c'n'}}) \\ &= \Sigma_{c'} \Sigma_{n'} \frac{\lambda_{cn}^{c'n'} E_{c'n'}}{\Sigma_{c*n*} \lambda_{cn}^{c*n*} E_{c*n*}} \widehat{\lambda_{cn}^{c'n'} E_{c'n'}} = \Sigma_{c'} \Sigma_{n'} \frac{(1-\alpha_{c'}) \frac{p_{c'n'} L_{c'n'}}{P_{c'}^{1-\sigma}}}{\Sigma_{c*n*} \frac{(1-\alpha_{c*}) p_{c*n*} L_{c*n*}}{P_{c*}^{1-\sigma}}} \widehat{\lambda_{cn}^{c'n'} E_{c'n'}} = \end{aligned} \tag{56}$$

$$\sum_{c' \neq US} \sum_{n'} \frac{\frac{(1-\alpha_{c'}) p_{c'n'} L_{c'n'}}{P_{c'}^{1-\sigma}}}{\sum_{c^*} \sum_{n^*} \frac{(1-\alpha_{c*}) p_{c^*n^*} L_{c^*n^*}}{P_{c^*}^{1-\sigma}}} \left[-\sigma \hat{p}_{cn} - (1-\sigma) \hat{P}_{c'} + \hat{p}_{c'n'} + \hat{L}_{c'n'} \right]$$

$$+ \sum_{n'} \frac{\frac{(1-\alpha_{US}) p_{US\,n'} L_{US\,n'}}{P_{US}^{1-\sigma}}}{\sum_{c^*} \sum_{n^*} \frac{(1-\alpha_{c*}) p_{c^*n^*} L_{c^*n^*}}{P_{c^*}^{1-\sigma}}} \left[-\sigma \hat{p}_{cn} - \sigma \widehat{(1+\tau_{cn})} - (1-\sigma) \hat{P}_{US} + \delta^{W}_{US,n'} (\hat{p}_{US\,n'} + \hat{L}_{US\,n'}) + \delta^{R}_{US,n'} \hat{R} \right] \tag{57}$$

Log Linearization of Tariff Revenues per US-born worker:

$$\widehat{R} = \frac{\widehat{T}}{\Sigma_{n*} L^0_{USn*}} = \widehat{T} \tag{58}$$

Log–linearizing the tariff revenues

We have:

$$T \;=\; \sum_{n^{US}} \sum_{c \neq US} \sum_{n} \tau_{cn}\, p_{cn}\, c_{cn}^{US,n^{US}}. \tag{59}$$

Revenue weights:

$$\omega_{cn}^{US,n^{US}} \;=\; \frac{\tau_{cn}\, p_{cn}\, c_{cn}^{US,n^{US}}}{T} \tag{60}$$

US workers' income is given by

$$E_{US,n^{US}} \;=\; w_{US,n^{US}}\, L_{US,n^{US}} + R\, L^0_{US,n^{US}}, \tag{61}$$

$$\widehat{E}_{US,n^{US}} \;=\; \frac{w_{US,n^{US}} L_{US,n^{US}}}{E_{US,n^{US}}} \big(\widehat{w}_{US,n^{US}} + \widehat{L}_{US,n^{US}} \big) \;+\; \frac{R}{E_{US,n^{US}}}\, \widehat{R}. \tag{62}$$

In addition:

$$\widehat{c}_{cn}^{US,n^{US}} \;=\; \widehat{E}_{US,n^{US}} \;-\; \sigma \big(\widehat{p}_{cn} + \widehat{(1+\tau_{cn})} \big) \;-\; (1-\sigma)\, \widehat{P}_{US} \tag{$\star$}$$

And:

$$\widehat{T} \;=\; \sum_{n^{US}} \sum_{c \neq US} \sum_{n} \omega_{cn}^{US,n^{US}} \left(\widehat{\tau}_{cn} + \widehat{p}_{cn} + \widehat{c}_{cn}^{US,n^{US}} \right) \tag{‡}$$

Substitute $(\star)$ **into** $(‡)$ **and get:**

$$\widehat{T} = \sum_{n^{US}} \sum_{c \neq US} \sum_{n} \omega_{cn}^{US,n^{US}} \Big[\widehat{\tau}_{cn} + \widehat{p}_{cn} + \frac{w_{US,n^{US}} L_{US,n^{US}}}{E_{US,n^{US}}} \big(\widehat{w}_{US,n^{US}} + \widehat{L}_{US,n^{US}} \big) + \frac{R}{E_{US,n^{US}}} \widehat{R} - \sigma \big(\widehat{p}_{cn} + \widehat{(1+\tau_{cn})} \big) - (1-\sigma) \widehat{P}_{US} \Big]. \tag{63}$$

Finally as $\hat{R} = \hat{T}$**, solving for** $\hat{T}$ **yields:**

$$\widehat{T} = \sum_{n^{US}} \sum_{c \neq US} \sum_{n} \delta^{n^{US}} \lambda_{cn} \Big(\widehat{\tau}_{cn} + \widehat{p}_{cn} + \tfrac{w_{US,n^{US}} L_{US,n^{US}}}{E_{US,n^{US}}} (\widehat{p}_{US,n^{US}} + \widehat{L}_{US,n^{US}}) - \sigma \big(\widehat{p}_{cn} + \widehat{(1+\tau_{cn})} \big) - (1-\sigma) \widehat{P}_{US} \Big] \Big[1 - \sum_{n^{US}} \sum_{c \neq US} \sum_{n} \delta^{n^{US}} \lambda_{cn} \frac{R}{E_{US,n^{US}}} \Big]$$

note:

$$\omega_{cn}^{US,n^{US}} = \frac{\tau_{cn}\, p_{cn}\, c_{cn}^{US,n^{US}}}{T}, \qquad \text{so treat } \omega_{cn}^{US,n^{US}} \text{ as the weight for all variables in changes,} \tag{64}$$

except for $d \log(1+\tau_{cn})$ where the corresponding differential weight is adjusted as in the note.

Calibration of $\omega_{cn}^{US,n^{US}}$

In order to implement the equation of the tariff revenues in log-changes, I need to calibrate for the initial revenue shares by US worker. These shares consist of initial tariff levels, prices, and consumption. As this detail of consumption data is not available, I calibrate it according to the model.

Namely, I will identify consumption by a US worker n^{US} for any pair (c, n) using the following characteristics of CES preferences:

$$c_{cn}^{US,n^{US}} = \frac{p_{cn}^{-\sigma}}{P_{US}^{1-\sigma}} \Big(w_{US,n^{US}} L_{US,n^{US}} + R L_{US,n^{US}}^{0} \Big) \tag{65}$$

$$T_{cn} = \tau_{cn}\, p_{cn} \sum_{n^{US}} c_{cn}^{US,n^{US}} \tag{66}$$

1. From the data on tariff revenue for (c, n):

$$\sum_{n^{US}} \tau_{cn}\, p_{cn}\, c_{cn}^{US,n^{US}} \;=\; T_{cn}.$$

2. Proportionality across workers (same price vector for all n^{US} within the US):

$$\forall\, c, n, j, m: \qquad \frac{c_{cn}^{US,j}}{c_{cn}^{US,m}} = \frac{W_{US,j} L_{US,j} + R}{W_{US,m} L_{US,m} + R} = \frac{E_{US,j}}{E_{US,m}}, \quad E_{US,j} \equiv (1-\alpha_{US})(w_{US,j} L_{US,j} + R).$$

Hence,

$$\tau_{cn} p_{cn} \sum_{n^{US}} c_{cn}^{US,n^{US}} = \tau_{cn} p_{cn}\, c_{cn}^{US,\bar{n}} \sum_{n^{US}} \frac{E_{US,n}}{E_{US,\bar{n}}} = T_{cn} \qquad \text{(for any reference worker } \bar{n}), \tag{67}$$

so the only unknown $c_{cn}^{US,\bar{n}}$ can be solved in closed form as

$$c_{cn}^{US,\bar{n}} = \frac{T_{cn}}{\tau_{cn}\, p_{cn}} \frac{E_{US,\bar{n}}}{\sum_{n^{US}} E_{US,n^{US}}} \tag{68}$$

This enables to calibrate $\omega_{cn}^{US,n^{US}} = \frac{\tau_{cn}\, p_{cn}\, c_{cn}^{US,n^{US}}}{T}$.

Model induced reduced form motivation

The aggregate demand of US workers for good/industry c,n is:

$$\Sigma_{n^{US}} \Sigma_c c_{cn}^{US,n^{US}} = (1-\alpha_{US}) \Sigma_{n^{US}} \Sigma_c \frac{(p_{cn}(1+\tau_{cn}))^{-\sigma}}{P_{US}^{1-\sigma}} E_{US,n^{US}} \tag{69}$$

The aggregate supply of good/indusrty n to the US is:

$$\Sigma_c e_{cn}^{US} L_{cn} \tag{70}$$

Where e_{cn}^{US} is the export share to the US out of the exports of c:n to the rest of the world.

Hence,

$$\Sigma_c e_{cn}^{US} L_{cn} = (1-\alpha_{US})\Sigma_{n^{US}}\Sigma_c \frac{(p_{cn}(1+\tau_{cn}))^{-\sigma}}{P_{US}^{1-\sigma}} E_{US,n^{US}} \tag{71}$$

Log-linearization of this equality yields:

$$\Sigma_c \frac{e_{cn}^{US} L_{cn}}{\Sigma_{c'} e_{c'n}^{US} L_{c'n}} (\hat{e}_{cn}^{US} + \hat{L}_{cn}) =$$

$$\Sigma_{n^{US}}\Sigma_c \frac{\frac{(p_{cn}(1+\tau_{cn}))^{-\sigma}}{P_{US}^{1-\sigma}} E_{US,n^{US}}}{\Sigma_{n^{US}*}\Sigma_{c*} \frac{(p_{c*n}(1+\tau_{c*n}))^{-\sigma}}{P_{US}^{1-\sigma}} E_{US,n^{US}*}} \left[-\sigma\hat{p}_{cn} - \sigma(1+\hat{\tau}_{cn}) - (1-\sigma)\hat{P}_{US} + \hat{E}_{US,n^{US}}\right] \tag{72}$$

Hence,

$$\hat{L}_{cn} = \frac{1}{s_{cn}^{US}}\Sigma_{n^{US}} s_{cn}^{US,n^{US}} \left[-\sigma\hat{p}_{cn} - \sigma(1+\hat{\tau}_{cn}) - (1-\sigma)\hat{P}_{US} + \hat{E}_{US,n^{US}}\right] - \hat{e}_{cn}^{US} +$$

$$\left[\frac{1}{s_{cn}^{US}}\Sigma_{n^{US}}\Sigma_{c**\neq c} \frac{\frac{(p_{c*n}(1+\tau_{c*n}))^{-\sigma}}{P_{US}^{1-\sigma}} E_{US,n^{US}}}{\Sigma_{n^{US}*}\Sigma_{c*} \frac{(p_{c*n}(1+\tau_{c*n}))^{-\sigma}}{P_{US}^{1-\sigma}} E_{US,n^{US}*}} \left[-\sigma\hat{p}_{c*n} - \sigma(1+\hat{\tau}_{c*n}) - (1-\sigma)\hat{P}_{US} + \hat{E}_{US,n^{US}}\right]\right.$$

$$\left.-\Sigma_{c**\neq c}\Sigma_{c**\neq c}\frac{s_{c**n}}{s_{cn}}(\hat{e}_{c**n}^{US} + \hat{L}_{c**n})\right] \tag{73}$$

This induces a mapping to reduced form estimation with country-time fixed effects which capture the country specific shocks over time, industry-time fixed effects which capture the residual labor demand change due to labor demand trends a given industry n from other countries, and weighting the tariff increases by the US import shares which are pull-factors due to US demand. [Note that in equilibrium $\hat{p}_{cn} = f(initial_{values}, \hat{\tau}_{cn}), \hat{e}_{cn}^{US} = g(initial_{values}, \hat{\tau}_{cn})$]

Namely,

$$-\hat{L}_{cn}^{c} = \pi_{cn}^{US} dlog(m_{cn}) = \xi_{ct} + \xi_{nt} + F(\sigma, \theta, e_{cn}^{US}) \cdot s_{cn}^{US} dlog(1+\tau_{cn}) \tag{74}$$

With weighting by initial migration.

What shapes labor mobility and real wage differences?

Labor Mobility: The log-linearized equilibrium conditions characterizes the dynamics of labor mobility in general equilibrium. Explicitly, several factors shape it. The first set of factors are parameters and initial values. Whenever the elasticity of migration to real income differences is higher, the labor mobility effect following those changes will be higher. In addition, the labor mobility increases with the initial rate of migrants to the US. In that sense, this captures initial migration networks effect. Beyond those constants, the general equilibrium wage difference between the US and a given country and industry increase mobility as well. However, the labor mobility itself yields a feedback effect (note the mobility term in the RHS demand side) which moderates the real wage changes as more migrants move.

Real wage differences: The labor demand is shaped by price changes, tariffs changes and workers mobility. Namely, tariffs on industry n country reduce the demand of US workers of the c:n good, and through substitution the demand for other domestic and foreign goods increases. In addition, as different countries experience lower wages due to US tariffs - their demand of other goods decreases as well, amplifying the direct effect of tariffs on a given country-industry. Combined with the substitution elasticity and high enough real expenditure shares of the US, both of those effects create a terms-of-trade adjustment which increases the real wage of US workers relatively to foreign workers. Moreover, it is important to note the the tariffs create a negative income effect which decreases the demand for US production, and both negative income and substitution effect (direct tariff term in the log linearized GE conditions) which decreases even more the demand of targeted foreign production.

10 Appendix B: Empirical Appendix

Population Placebo Event Study

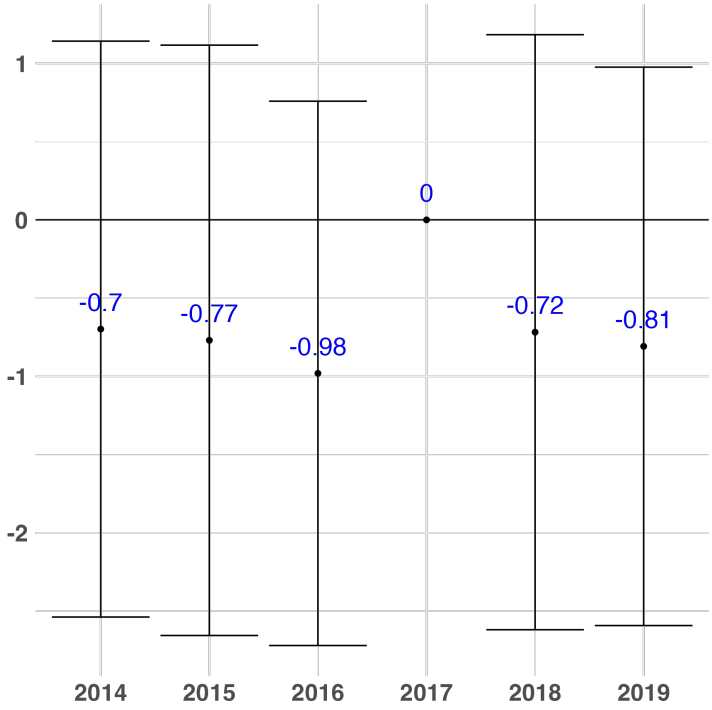


Figure 8: N = 4,406, Adj. R^2=0.91, SE clustered by industry

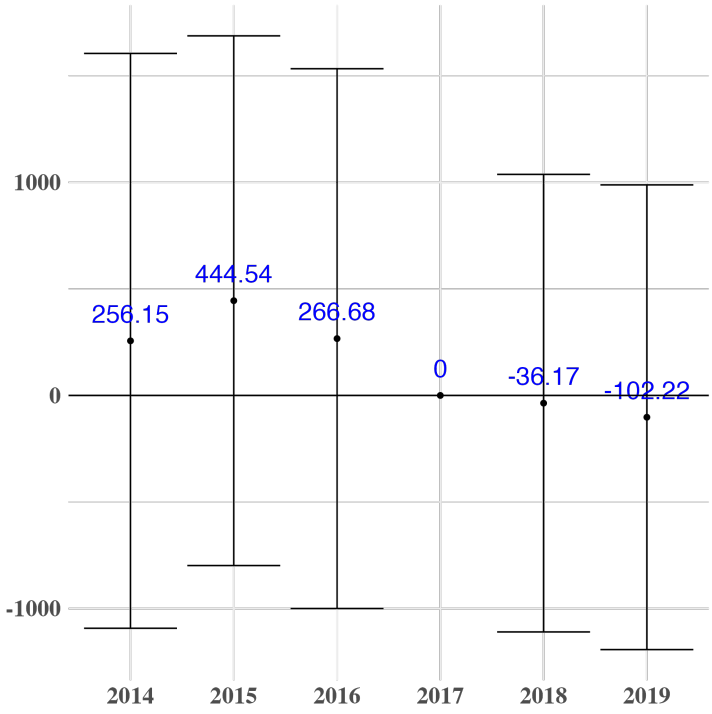


Figure 9: N = 63,500, Adj. R^2 = 0.9, $HC1$ SD

Exploiting the time variation of tariffs to include industry-country FE

Table 12: Regression Results: Effect of Tariff Exposure on Migration, including Industry:Country FE

Dependent variable:	*log(Immigrants Flow$_{ict}$)*
I(year = 2019, 2018) * Tariff Exposure(ict)	2.54
	[1.35]*
	(1.61)
Origin Country-Industry FE	YES
Origin Country-Time FE	YES
Industry-Time FE	YES
Observations	540
R^2	0.95
Adjusted R^2	0.87
Residual Std. Error	13.02 (df = 202)
F Statistic	12.32*** (df = 202; 337)
Note:	$^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$

Standard errors are in square brackets, clustered by industry standard errors are in parentheses

Event Study models excluding Mexico and Canada

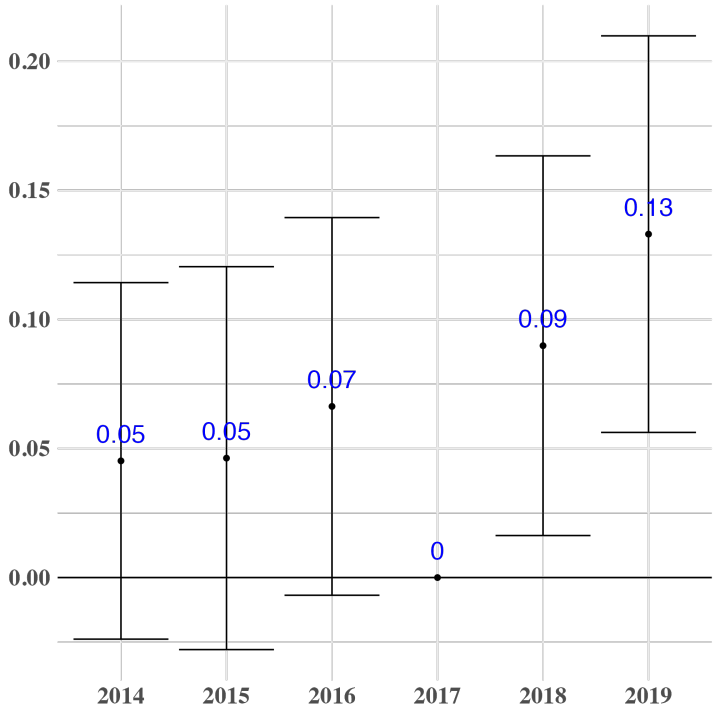


Figure 10: Enter Caption

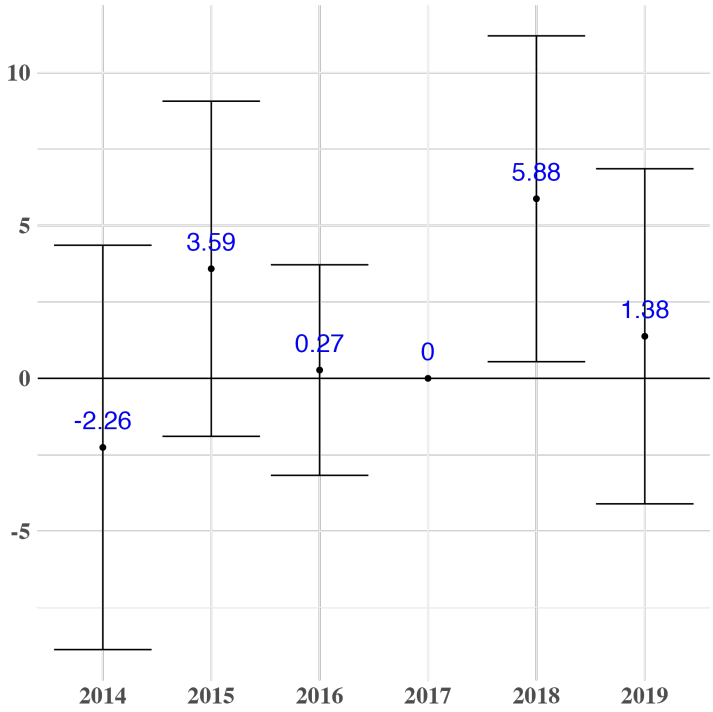


Figure 11: Enter Caption

Timing Placebo

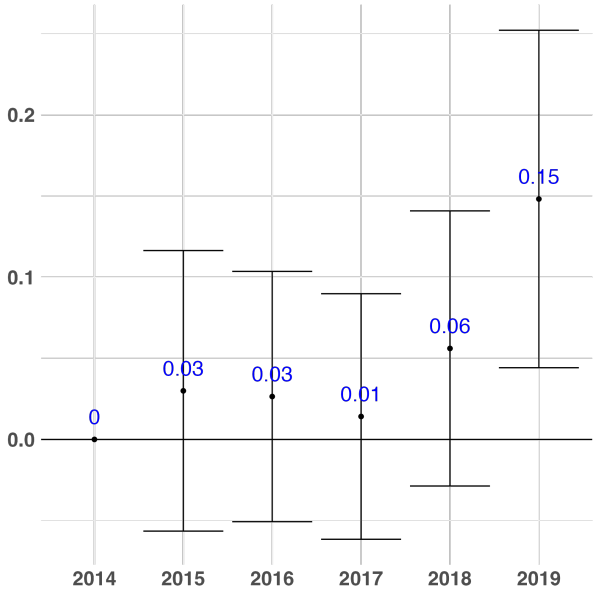


Figure 12: Enter Caption

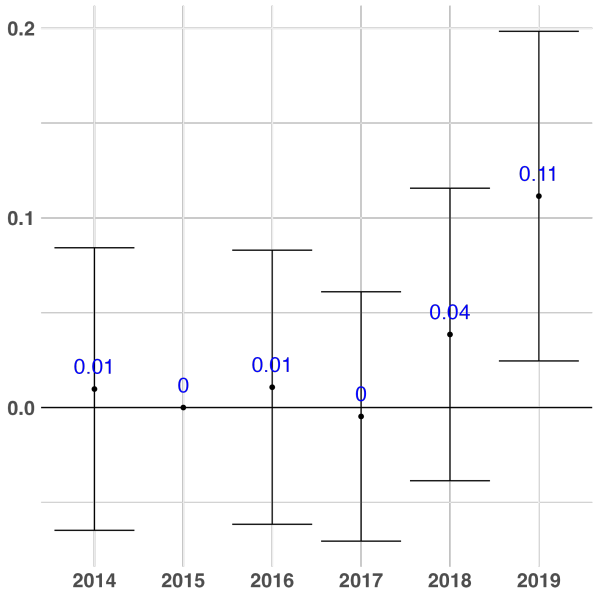


Figure 13: Enter Caption

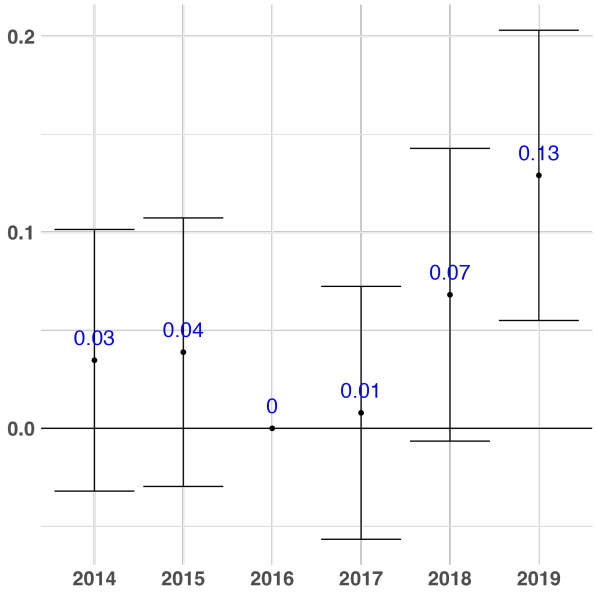


Figure 14: Enter Caption

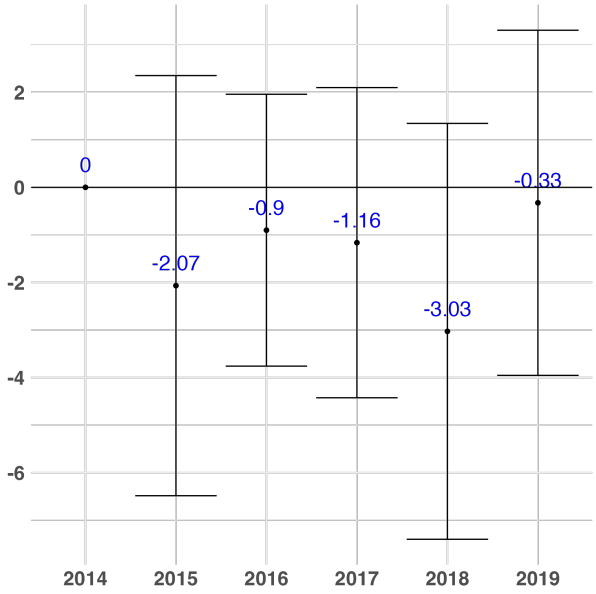


Figure 15: Enter Caption

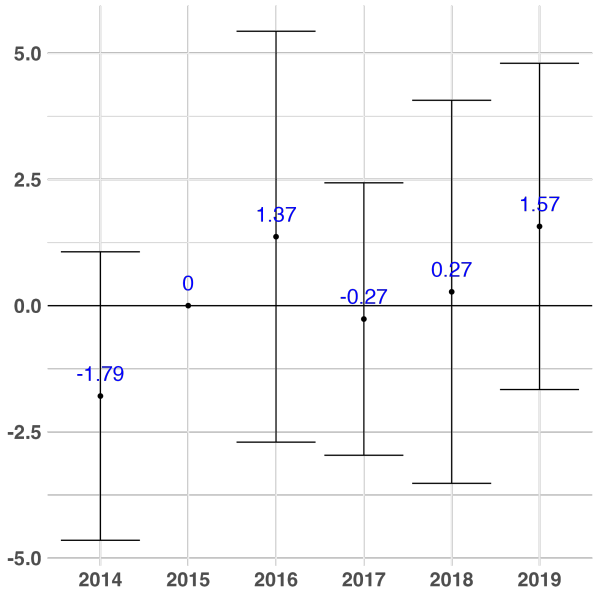


Figure 16: Enter Caption

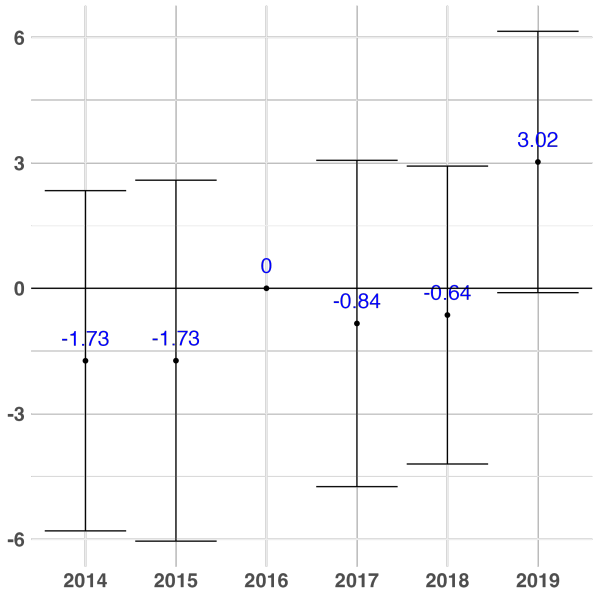


Figure 17: Enter Caption

Additional Figures

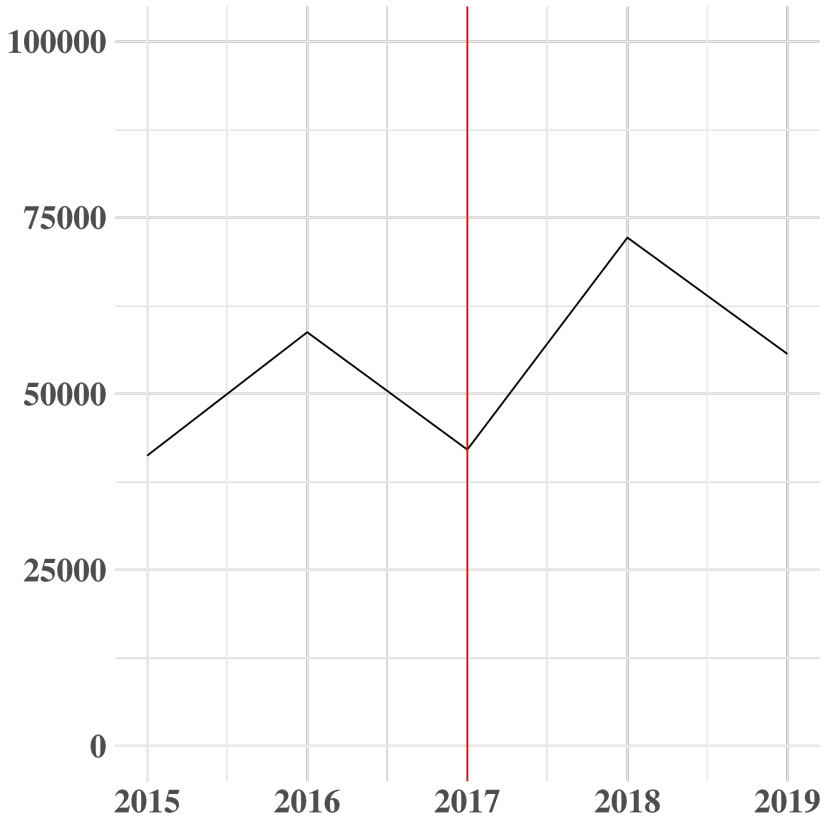


Figure 18: Certified Foreign Born Permanent Working Authorizations, by year

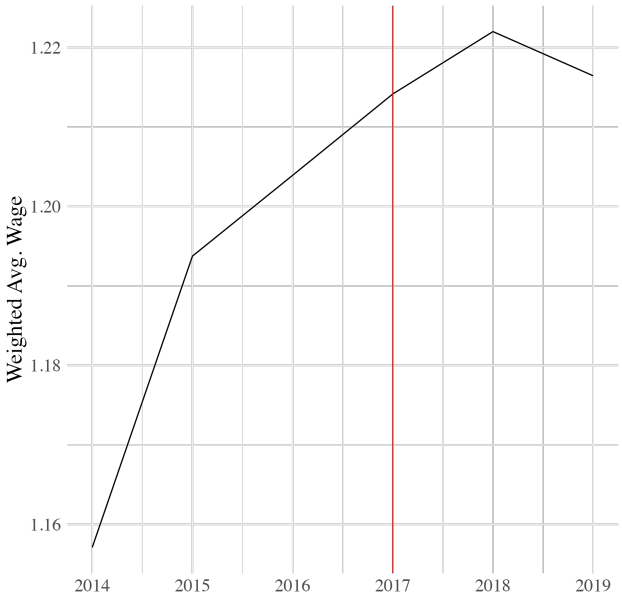


Figure 19: The ratio between US-born workers average wage to migrants' average wage