Brenda Teruya Spring 2026

Transit Migration in Mexico: Evidence from The Beast

Abstract

This paper examines the economic and social consequences of transit migration through Mexico, focusing on migrants traveling from Central and South America toward the United States. While existing literature on migration economics has predominantly focused on destination countries, particularly the United States, this study contributes to the emerging literature on transit countries that bear significant but understudied costs of international migration flows.

Using a shift-share instrumental variable approach that exploits spatial variation in Mexico's freight rail network (known colloquially as "La Bestia") and temporal variation in non-North American arrivals to Mexico, I estimate the causal effects of predicted transit migration exposure on crime victimization in Mexican municipalities. I combine data from Mexico's national victimization survey (ENVIPE, 2011-2024), population censuses (2010, 2020), employment surveys (ENOE, 2007-2019), and administrative records on international arrivals to construct municipality-year panel data spanning 2008-2019.

The findings reveal that increased transit migration exposure significantly increases crime victimization rates among Mexican residents, with particularly pronounced effects for sexual assault and kidnapping, crimes for which existing qualitative evidence suggests migrants themselves are often victims. I find overall victimization probability increases, with effects concentrated among young adults aged 25-30. The analysis demonstrates that some transit migrants remain in Mexico rather than completing their intended journey to the United States, and that municipalities along major migration corridors experience measurable increases in both immigrant settlement and crime rates. These results suggest that transit countries bear substantial externalities from hemispheric migration patterns shaped largely by policies and conditions in origin and destination countries, raising important questions about the distribution of migration-related costs across the international system.

Motivation and Introduction

Immigration has been a central policy concern in the United States for decades, influencing electoral debates and shaping discussions across multiple domains of American life. The economics of immigration has generated an extensive academic literature dating back several decades, with researchers examining how immigrant populations affect destination countries across multiple dimensions. Two particularly prominent strands of this literature investigate the labor market impacts of immigration (Borjas, 2003; Card, 1990; Peri & Yasenov, 2019) and the relationship between immigration and crime (Chalfin, 2015; Chalfin & Deza, 2020). While the majority of this research focuses on the United States as a destination country, considerably less attention has been paid to the transit countries through which many migrants pass on their journey northward.

This study examines an understudied dimension of international migration: the economic and social effects of transit migration through Mexico. As migrants from Central America, South America, Venezuela, and other regions attempt to reach the United States, they must first traverse Mexican territory, often undertaking dangerous journeys aboard freight trains colloquially known as "La Bestia" (The Beast). This transit migration phenomenon has evolved considerably in recent years, with the composition of migrants shifting away from predominantly Mexican nationals toward increasing numbers of Central Americans and Venezuelans seeking passage to the U.S. border (as evidenced by U.S. border apprehension data showing dramatic increases in non-Mexican detentions since 2019).

The transit migration experience represents a distinct phenomenon from traditional immigration studies. Unlike permanent or long-term migrants who settle in destination countries, transit migrants occupy an ambiguous status—temporarily present in Mexican municipalities but oriented toward onward movement. This transitory nature creates unique challenges for measurement and analysis, as these populations largely escape capture in standard household surveys and census enumeration. Nevertheless, their presence along established migration corridors may generate significant local effects on crime patterns, labor markets, and municipal resources in the communities through which they pass or in which some ultimately remain.

This research contributes to the migration literature by examining how predicted transit migration flows through Mexican municipalities—proxied through a shift-share instrumental variable approach utilizing historical train routes and temporal variation in border crossings—affect local crime victimization patterns. The analysis draws on data from Mexico's national victimization survey (ENVIPE, 2011-2024), population censuses (2010, 2020), employment surveys (ENOE, 2007-2019), and administrative records on

international arrivals. Preliminary findings suggest that municipalities with greater exposure to transit migration routes experience increases in overall crime victimization, with particularly pronounced effects for sexual assault and kidnapping—crimes that existing qualitative evidence suggests disproportionately affect migrants themselves as victims.

These results raise important questions about the distribution of costs associated with international migration patterns, suggesting that transit countries bear significant burdens that have received insufficient attention in both policy discussions and academic research. Understanding these dynamics is particularly relevant as U.S. immigration enforcement policies increasingly push migrants toward more dangerous routes and as cooperation agreements between the United States and Mexico place greater responsibility on Mexican authorities to manage northbound migration flows.

Background

The Infrastructure of Informal Transit

Central American and South American migrants traveling through Mexico toward the United States have developed an informal transit system centered on Mexico's freight rail network, colloquially known as "La Bestia" (The Beast) or "El Tren de la Muerte" (The Train of Death). This network consists of approximately 1,880 distinct train routes spanning the length of Mexico, from the southern border with Guatemala northward to various points along the U.S.-Mexico border. The geographic distribution of these routes creates predictable corridors through which transit migrants flow, with certain municipalities experiencing disproportionate exposure to transit migration based on their position along these rail lines.

The train routes are operated by commercial freight companies and were never designed or intended for passenger transport. Nevertheless, they have become the primary means of northward movement for migrants who lack the financial resources to pay for formal transportation or the legal documentation to travel openly through Mexico. Migrants typically board these trains while they are in motion, jumping onto moving freight cars to avoid detection by authorities at formal train stops. This practice of boarding moving trains is necessitated by the fact that Mexican immigration authorities and criminal organizations often monitor official train stations, making these locations particularly dangerous for undocumented migrants.

The Cost-Benefit Calculus: Zero Monetary Cost, Maximum Physical Risk

From an economic standpoint, the appeal of La Bestia is straightforward: it represents free transportation across vast distances. Migrants who may have exhausted their financial resources reaching Mexico's southern border can traverse the entire length of the country without paying for tickets, accommodations, or other formal travel expenses. This zero monetary cost stands in stark contrast to alternative migration strategies, such as hiring smugglers (coyotes) who may charge thousands of dollars for passage, or attempting to travel by bus or other commercial means that require both money and identification documents that most transit migrants lack.

However, the physical and human costs of this "free" transportation are extraordinarily high. As news reports document, "Migrants travel on top of the train with nothing to hold on to. Accidents caused by train derailments and falls because of changes in speed or migrants falling asleep are common and have resulted in countless injuries, amputations, and sometimes death" (NPR). Workers at migrant shelters report seeing individuals "with

all broken fingers because they need to hold tight from the train" to avoid being thrown from the cars during the journey.

The dangers extend well beyond accidental injury. Female migrants face particularly acute risks of sexual violence during the journey. Ethnographic research by Vogt (2013) documents how "[The violence] is a continuation of the processes they have known their whole lives," while reporting from migrant experiences reveals that "many female teenagers have their train boyfriend to protect themselves from rape" (Mendoza, 2020)—a survival strategy that itself reflects the normalization of gender-based violence along migration routes. One migrant woman recounted finding her husband "almost dead, beaten up by Mexican authorities" and stated, "If I had known what I was about to happen I would have never come to Mexico" (Fox News).

Criminal organizations, particularly drug cartels, have increasingly targeted migrants traveling on La Bestia for extortion, kidnapping, forced recruitment, and other forms of victimization. The trains pass through territories controlled by various criminal groups, and migrants riding on top of the freight cars are highly visible and completely vulnerable targets. Those who resist may be thrown from the trains or face lethal violence.

Geographic Distribution and Measurement

The spatial distribution of La Bestia routes creates significant geographic variation in exposure to transit migration across Mexican municipalities. Using Geographic Information Systems (GIS) data on train routes provided by Mexico's Transport Agency (Agencia de Transporte), this study maps the density of rail infrastructure at the municipal level. The train network exhibits a clear pattern, with the highest concentration of routes running through the western and central corridors of Mexico, from Chiapas and Tabasco in the south, through Veracruz, Mexico City, and the Bajío region, and northward to border cities including Tijuana, Mexicali, Nogales, Agua Prieta, Ciudad Juárez, Piedras Negras, and Matamoros.

Municipalities can be categorized by their share of the total train route network. For example, Agua Prieta (located in Sonora state on the Arizona border) contains 3 out of the 1,880 total train routes that traverse Mexico, placing it at the 75th percentile of train route exposure. In contrast, Zaragoza (located in Coahuila state) falls at the 25th percentile of exposure. This variation in infrastructure density provides the foundation for the shift-share instrumental variable strategy, as municipalities with greater shares of the rail network should theoretically experience higher volumes of transit migration when overall northbound flows increase.

The study constructs a shift-share measure by interacting each municipality's time-invariant share of Mexico's train route network with the annual number of non-North American arrivals to Mexico (measured in thousands, excluding Canadian and U.S. citizens who are unlikely to be transit migrants). This interaction term represents the predicted exposure of municipality m to transit migration in year t. The measure assumes that migrants distribute themselves across municipalities in proportion to available rail infrastructure, weighted by the total volume of potential transit migrants entering Mexico each year.

Importantly, this measure captures only the rail network infrastructure, not actual train schedules, frequencies, or migrant counts. The underlying assumption is that in municipalities with more extensive rail networks, migrants have more opportunities to board trains and are more likely to be present either riding through or waiting for trains to pass. This creates a form of treatment intensity that varies both across space (some municipalities have more routes than others) and across time (as the number of potential transit migrants arriving in Mexico fluctuates with conditions in origin countries and policy changes affecting migration flows).

What remains clear is that the journey aboard La Bestia imposes enormous costs, on the migrants who risk their lives seeking better opportunities, on the Mexican communities through which they pass, and on the social fabric of municipalities that find themselves involuntarily positioned as corridors in a hemispheric migration system largely shaped by policies and economic conditions beyond their control.

Data and Methods

The data comes from several sources. For the Train I use Transport Agency and for the shelters the geocoded file from BBVA Mexico. I use the statistical Bulletin 2008 – 2024 excluding North American arrivals to know the origin country of each immigrant.

For the outcomes I use the victimization survey (ENVIPE 2011-2024) and I plan to use the official records of crime according to SESNP. For the employment outcomes I use ENOE 2001-2019, finally I use the Full count Census 1990, 2000, 2010, and 2020, to analyze the immigrants who stay in Mexico in their journey north.

The method for the train exposure is an interaction as exposure: the percentage of route times the N. crossings (shift-share)

For any given municipality m The share will be share of routes

$$strainRoute_m = \frac{N\ train\ routes\ in\ muni}{Total\ train\ routes\ in\ Mexico}$$

Shift-share for municipality m time t

$$Train_{mt} = N.crossings_t\ x\ strainRoute_m$$

This measures the expected N. of immigrants in the municipality. That is, if Municipality Agua Prieta has 2% of the routes, then I expect that 2% of the migrants in each year go through there

I interact this share of exposure with the N. crossing excluding North America. To enter Mexico most countries do not need a visa. Few Central American countries like Honduras, El Salvador, Nicaragua, or Haiti citizens need a visa to enter Mexico. This means, even the entries by plane could potentially be transit migrants. Hence, I include both entries by plane and land.

Another measure of immigration I use is the enclave exposure. I will use a shift-share instrument using the nationalities as enclaves

This will measure the expected number of migrants due to their networks

$$ShiftShare_{mt} = \sum_o \mathrm{imm}_{\mathrm{o,2000}}\ \mathrm{imm}_{\mathrm{omt}}$$

Which measure the expected number of migrants due to the migrant networks in each municipality

Is the interaction between immigrants from each country of origin in the base year 2000 times the exposure of each municipality per year to each immigrant

As a weighted average of the exposure of each municipality per country of origin, where the weights are the enclaves in 2000

The estimation strategy is

$$y_{imt} = \beta_o + \beta_1 Train_{mt} + \beta_2 ShiftShare + \lambda_m + \lambda_t + e_{mt}$$

y_{imt} is the outcomes of interest whether the person was a victim of a crime

λ_m, λ_t are municipality and time Fixed Effects

The coefficients of interest are β_1 and β_2 which will tell us the effect of expected migrants due to the train or due to the enclaves

For the heterogeneity analysis I use the exposure when train is high or low.

$$y_{imt} = \beta_o + \beta_1 Train\ when\ enclave\ low_{mt} + \beta_2 Train\ when\ enclave\ high_{mt}$$
$$+\lambda_m + \lambda_t + e_{mt}$$

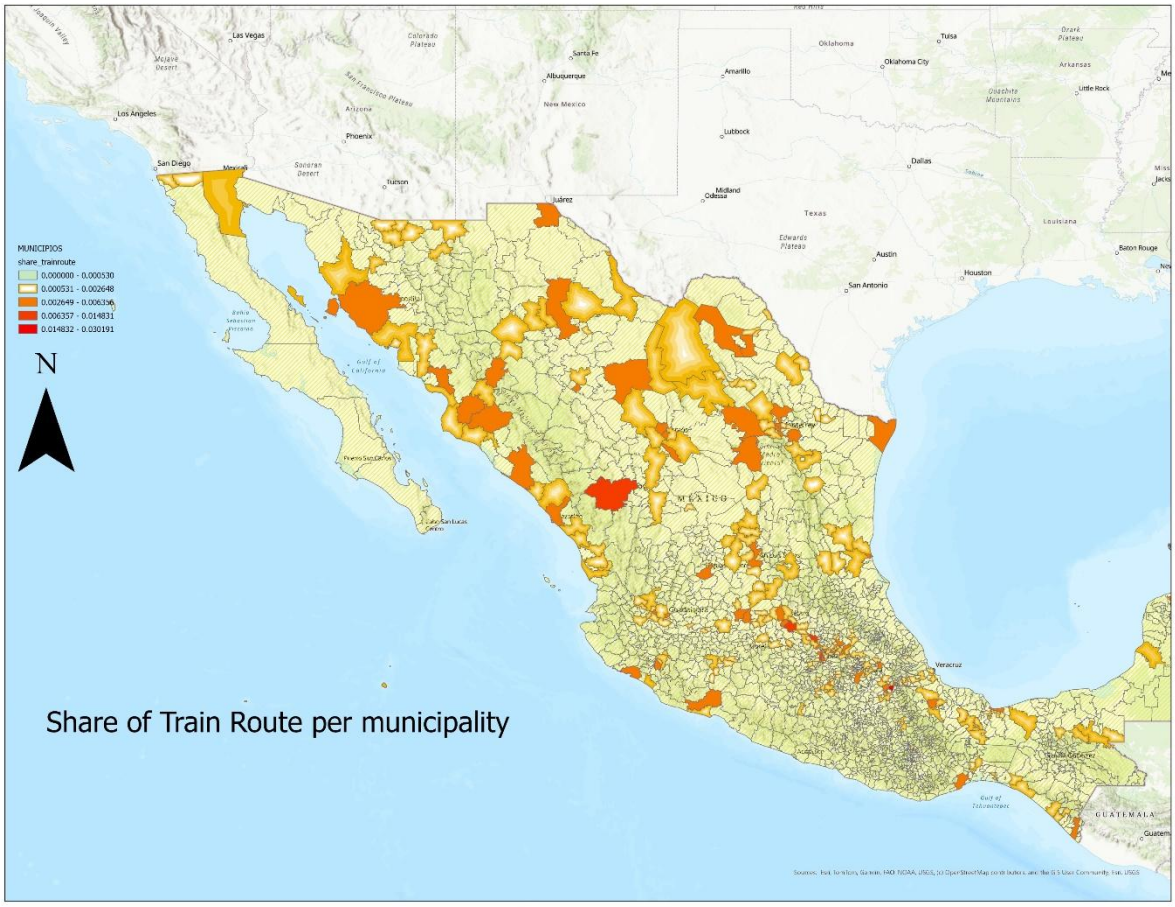
Which tells us how does the train exposure varies if the enclave is below or above the median

Another estimation is

$$y_{imt} = \beta_o + \beta_1 Enclave\ when\ train\ low_{mt} + \beta_2 Enclave\ when\ train\ high_{mt}$$
$$+\lambda_m + \lambda_t + e_{mt}$$

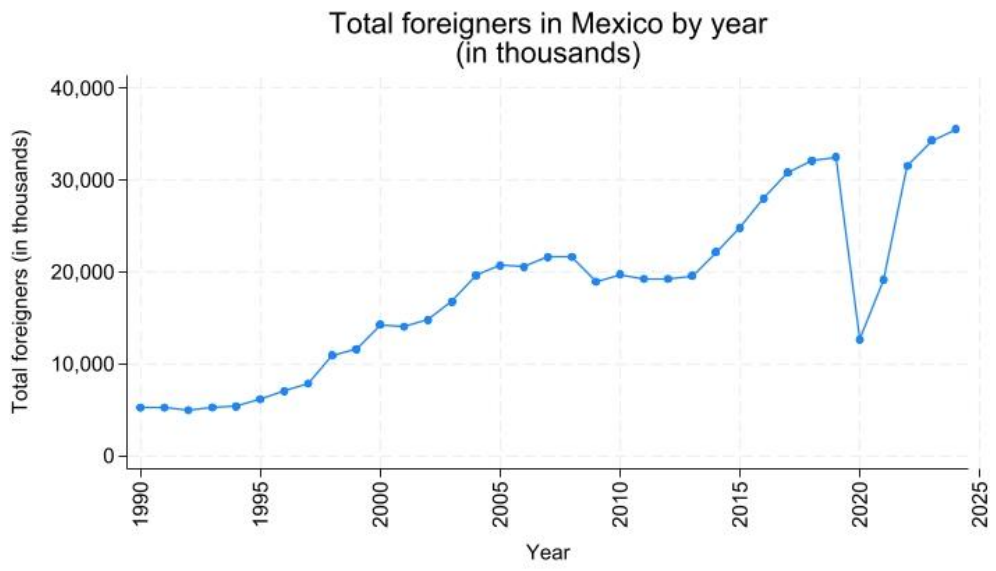
Which tells us the importance of enclave when the exposure of the train is above or below the median

Figure 1 Share of Train Route per municipality



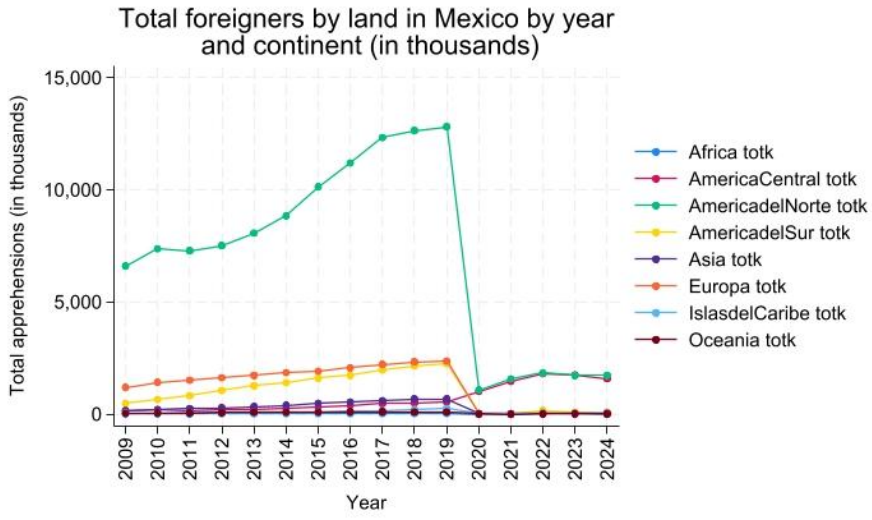
This graph shows each municipality's exposure to the train.

Figure 2 Total Foreigners in Mexico



The prior graph shows that in 2020 there was a strong effect in the number of arrivals due to the lock down. I will use data before 2020. When we analyze per origin region, I observe the region most hit by the lockdown was North America.

Figure 3: Total Foreigners in Mexico by continent



Results

I observe that the measure of train exposure has a mean of 5 thousand expected migrants.

Figure 4: Density of Train Exposure

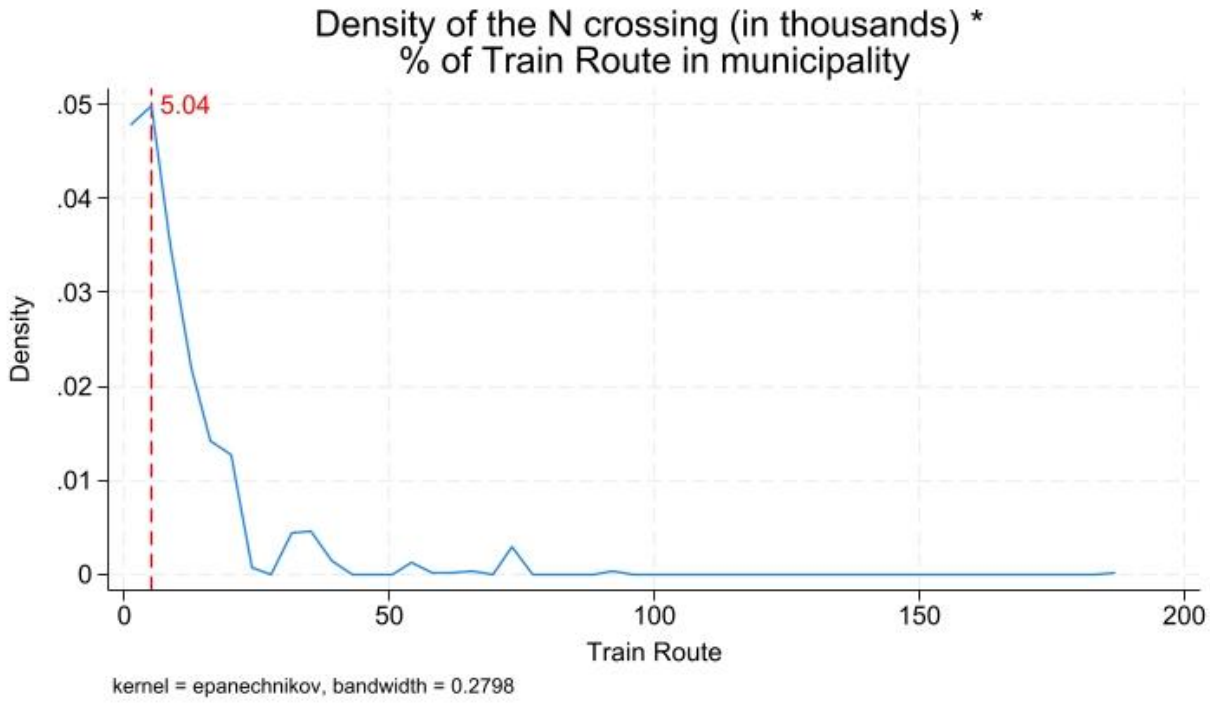


Table 1: First Stage shift-share enclave

VARIABLES	(1) Immigrant per 10k pop	(3) Recent Immigrant per 10k pop
Shift Share in 10,000	-3.11	-4.83
	(21.74)	(21.99)
Observations	3,216	3,216
Municipality FE	Y	Y
Year FE	Y	Y
Demographic controls	N	N
Mean Y	425.52	433.39
Mean X	0.38	0.38
Percent Change 1 unit	-0.0073	-0.0111
Percent Change 25th pct	-0.0002	-0.0003
Percent Change 75th pct	-0.0021	-0.0032

Table 2: First Stage train exposure

VARIABLES	(1) Immigrant per 10k pop	(3) Recent Immigrant per 10k pop
Train Route in 10,000	116.04**	106.74**
	(54.11)	(53.95)
Observations	3,216	3,216
Municipality FE	Y	Y
Year FE	Y	Y
Demographic controls	N	N
Mean Y	425.52	433.39
Mean X	0.97	0.97
Percent Change 1 unit	0.2727	0.2463
Percent Change 25th pct	0.1952	0.1768
Percent Change 75th pct	0.9251	0.8377

Table 3: First Stage shift-share enclave and train

VARIABLES	(1) Immigrant per 10k pop	(3) Immigrant per 10k pop
Train Route in 10,000	120.25**	111.06**
	(55.30)	(55.12)
Shift Share in 10,000	-19.21	-19.70
	(23.21)	(23.39)
Observations	3,216	3,216
Municipality FE	Y	Y
Year FE	Y	Y
Demographic controls	N	N
Mean Y	425.52	433.39

For the first stage, the impact of immigrant crossing on the immigrants who stay, I observe that the best measure is the train route instead of the enclave instrument. This means that train route affects immigrants but the enclave shift-share instrument doesn't.

At the same time I observe that the train matters even when the shift-share of the co-nationality is low or high.

When I observe the demographics, I see that the people along the enclaves are less educated and poor. The train routes changes demographics like the share of female, the education and poverty. Hence, I will not control for demographics under the main specification because the demographics are changing.

The main result shows that the train affects the probability of victimization, specially when the enclave instrument in high. When I analyze the heterogeneous effects, I observe the crimes are driven mostly by part 1 violent crimes.

When I analyze mechanisms I observe that the crimes are not driven by unemployment or economic reasons.

Table 4: First Stage shift-share enclave and train heterogeneity

Part 3 Both PANEL B

VARIABLES	(1) Immigrant per 10k pop	(3) Immigrant per 10k pop
Train exposure when enclave is low	363.69***	345.08***
	(133.42)	(133.00)
Train exposure when enclave is high	153.06***	142.37**
	(59.28)	(58.98)

Part 3 Both PANEL C

VARIABLES	(1) Immigrant per 10k pop	(3) Immigrant per 10k pop
Shift-share enclave exposure when train is low	-34.22	-32.73
	(22.16)	(22.24)
Shift-share enclave exposure when train is high	7.42	4.62
	(28.28)	(28.59)
Observations	3,216	3,216
Municipality FE	Y	Y
Year FE	Y	Y

Demographic controls	N	N
Mean Y	425.52	433.39

Table 5: Demographics and enclave

VARIABLES	(1) Share of Female	(2) Share of College or more	(3) Share in First Quartile of Income	(4) Share of literacy	(5) Share of age 16-65
Shift Share in 10,000	0.0001	-0.0005	0.0017***	-0.0003***	0.0001
	(0.0001)	(0.0004)	(0.0005)	(0.0001)	(0.0002)
Observations	3,216	3,216	3,216	3,216	3,216
Municipality FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
Demographic controls	N	N	N	N	N
Mean Y	0.51	0.05	0.09	0.99	0.60
Mean X	0.38	0.38	0.38	0.38	0.38
Percent Change 1 unit	00.0002	-0.0112	00.0181	-0.0003	00.0002
Percent Change 25th pct	00.0000	-0.0002	00.0003	00.0000	00.0000
Percent Change 75th pct	00.0000	-0.0024	00.0032	-0.0001	00.0000

Table 6: Demographics and train

VARIABLES	(1) Share of Female	(2) Share of College or more	(3) Share in First Quartile of Income	(4) Share of literacy	(5) Share of age 16-65
Train Route in 10,000	-0.0002*	-0.0022***	0.0014**	-0.0004***	-0.0004
	(0.0001)	(0.0004)	(0.0006)	(0.0001)	(0.0003)
Observations	3,216	3,216	3,216	3,216	3,216
Municipality FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
Demographic controls	N	N	N	N	N
Mean Y	0.51	0.05	0.09	0.99	0.60
Mean X	0.97	0.97	0.97	0.97	0.97
Percent Change 1 unit	-0.0004	-0.0473	0.0153	-0.0004	-0.0006
Percent Change 25th pct	-0.0002	-0.0302	0.0081	-0.0002	-0.0004
Percent Change 75th pct	-0.0010	-0.1430	0.0382	-0.0012	-0.0017

Table 7: Demographics train and enclave

VARIABLES	(1) Share of Female	(2) Share of College or more	(3) Share in First Quartile of Income	(4) Share of literacy	(5) Share of age 16-65
Train Route in 10,000	-0.0002*	-0.0021***	0.0011*	-0.0004***	-0.0004
	(0.0001)	(0.0004)	(0.0006)	(0.0001)	(0.0003)
Shift Share in 10,000	0.0001	-0.0002	0.0015***	-0.0002***	0.0002
	(0.0001)	(0.0003)	(0.0005)	(0.0001)	(0.0002)
Observations	3,216	3,216	3,216	3,216	3,216
Municipality FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
Demographic controls	N	N	N	N	N
Mean Y	0.51	0.05	0.09	0.99	0.60

Table 8: Demographics enclave, train, and heterogeneity

Part 3 Both PANEL B

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Share of Female	Share of College or more	Share in First Quartile of Income	Share of literacy	Share of age 16-65
Train exposure when enclave is low	-0.0003	-0.0032***	-0.0026*	-0.0005**	-0.0011*
	(0.0002)	(0.0008)	(0.0014)	(0.0002)	(0.0006)
Train exposure when enclave is high	-0.0002*	-0.0023***	0.0008	-0.0004***	-0.0005*
	(0.0001)	(0.0004)	(0.0006)	(0.0001)	(0.0003)

Part 3 Both PANEL C

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Share of Female	Share of College or more	Share in First Quartile of Income	Share of literacy	Share of age 16-65
Shift-share enclave exposure when train is low	0.0001	-0.0001	0.0033***	-0.0000	0.0006
	(0.0003)	(0.0009)	(0.0013)	(0.0001)	(0.0004)
Shift-share enclave exposure when train is high	0.0001	-0.0007	0.0012**	-0.0004***	-0.0000
	(0.0001)	(0.0004)	(0.0006)	(0.0001)	(0.0002)

Observations	3,216	3,216	3,216	3,216	3,216
Municipality FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
Demographic controls	N	N	N	N	N
Mean Y	0.51	0.05	0.09	0.99	0.60

Table 9: Effects on crime

VARIABLES	Victim	Victim	Victim
PANEL A			
N crossing (in ten thousands) * % of trainroute in municipality	0.0024**		0.0023*
	(0.0011)		(0.0013)
Shift Share in 10,000		0.0010*	0.0004
		(0.0005)	(0.0007)
PANEL B			
Train exposure when enclave is low	0.0018		
	(0.0025)		
Train exposure when enclave is high	0.0025**		
	(0.0010)		
PANEL C			
Shift-share enclave exposure when train is low	0.0017**		
	(0.0008)		
Shift-share enclave exposure when train is high	0.0010*		
	(0.0005)		
Observations	2,402,964	2,402,964	2,402,964
Municipality FE	Y	Y	Y
Year FE	Y	Y	Y

Demographic controls	N	N	N

Table 10: Effects on crime by type

VARIABLES	Probaility part1_violent	Probaility part1_violent	Probaility part1_violent	Probaility part1_property	Probaility part1_property	Probaility part1_property	Probaility part2_property	Probaility part2_property	Probaility part2_property	Probaility part2_other	Probaility part2_other	Probaility part2_other
PANEL A												
N crossing (in ten thousands) * % of trainroute in municipality	0.00025		0.00017	0.00186**		0.00160	0.00100		0.00088	0.00026		0.00025
	(0.00016)		(0.00017)	(0.00089)		(0.00099)	(0.00073)		(0.00087)	(0.00040)		(0.00044)
Shift Share in 10,000		0.00024***	0.00019**		0.00108**	0.00062		0.00054*	0.00029		0.00010	0.00003
		(0.00007)	(0.00009)		(0.00049)	(0.00050)		(0.00032)	(0.00047)		(0.00032)	(0.00036)
PANEL B												
Train exposure when enclave is low	-0.00009			0.00125			0.00106			0.00005		
	(0.00024)			(0.00134)			(0.00184)			(0.00082)		
Train exposure when enclave is high	0.00028**			0.00191**			0.00100			0.00028		
	(0.00013)			(0.00085)			(0.00069)			(0.00037)		
PANEL C												
Shift-share enclave exposure when train is low	0.00029***			0.00168**			0.00098**			-0.00004		
	(0.00008)			(0.00068)			(0.00039)			(0.00034)		
Shift-share enclave exposure when train is high	0.00024***			0.00111**			0.00057*			0.00010		
	(0.00007)			(0.00051)			(0.00032)			(0.00032)		
Observations	2,402,964	2,402,964	2,402,964	2,402,964	2,402,964	2,402,964	2,402,964	2,402,964	2,402,964	2,402,964	2,402,964	2,402,964
Municipality FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table 11: Effects on unemployment

	(1)	(2)	(3)
VARIABLES	Unemployment	Unemployment	Unemployment
Train Route in 10,000	-0.0003		-0.0002
	(0.0002)		(0.0002)
Shift Share in 10,000		-0.0010***	-0.0010***
		(0.0001)	(0.0001)
Observations	7,015,076	7,015,076	7,015,076
Municipality FE	Y	Y	Y
Year FE	Y	Y	Y
Demographic controls	N	N	N
Mean Y	0.05	0.05	0.05

Conclusions and future

I observe that the train matters more than the enclaves. The enclaves measure how much migrants look for their co-nationals. The effects on crime seem to induce more violent crimes, it is not driven by economic hardship, and the train matters more when the enclave is high, meaning a amplification effect.

Moving forward I would like to use the data from the official records and analyze the black data which is the underreporting of crimes in Mexico. I would like to analyze the reasons for not reporting and the differences in the records.

I would like to add heterogeneity by urban and rural, crime in terms of gender and age groups.

For robustness I would like to add time by year fixed effects, weights by population.

As an additional exercise I would like to repeat everything for the train stops and the shelters.