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Economic Resilience of Migrants' Transit Routes: Evidence from Venezuela's Refugee Shock

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Abstract

Did large-scale migration foster local economic resilience along border transit routes after Venezuela's 2017 refugee shock? Combining monthly municipal nighttime lights and outmigration data with three measures of exposure to border transit, we estimate difference-in-differences and event-study models for 2016–2020. Border transit municipalities display low initial resistance: luminosity fell and outmigration rose as low-migration-cost residents left first. Both patterns reversed in late 2018, suggesting adaptive re-orientation: as interior migrants concentrated along the corridor, demand for transportation, commerce, and services sustained local activity and attenuated residents' outmigration. Border transit areas benefited from reorganizing around the demand the crisis itself generated.

Keywords: transit migration; economic resilience; border economies; Venezuela

JEL codes: F22; O18; R11; O54

Introduction

Large-scale migration flows can shape local economic dynamics not only in destination areas but also along transit corridors. In the context of severe macroeconomic shocks, migration routes can generate localized economic opportunities that partially offset broader economic decline. Concentrated population movements can increase the demand for transportation, informal trade, food services, temporary accommodation, and cross-border commerce, allowing certain territories to sustain or reorganize economic activity despite adverse national conditions. These dynamics may partially sustain localized economic activity despite the broader deterioration of formal economic structures. Whether transit migration can contribute to local economic resilience therefore remains an open empirical question. Venezuela provides a particularly relevant setting to study these dynamics given the simultaneous presence of economic collapse, institutional deterioration, and one of the largest displacement crises in contemporary Latin American history. Between 2013 and 2020, the Venezuelan economy contracted by more than 70 percent [[Economic Commission for Latin America and the Caribbean, 2021](#)]. Worsening living conditions triggered a large-scale process of outward migration that transformed the Venezuelan crisis into a regional displacement phenomenon. By 2020, more than 5.4 million Venezuelans had left the country [[R4V – Inter-Agency Coordination Platform for Refugees and Migrants from Venezuela, 2021](#)], with most of them entering Colombia through a narrow set of border crossing points.

This paper examines whether these narrow migration corridors experienced local economic resilience to the Venezuelan economic collapse once the refugee crisis ensued in 2017. The analysis tests the hypothesis that municipalities more exposed to concentrated migrant transit experienced relatively stronger economic performance than less exposed areas during the national economic collapse. To evaluate this hypothesis, we employ a quasi-experimental difference-in-differences strategy complemented by an event-study framework. Economic activity is proxied using satellite-based nighttime light intensity, which provides a consistent subnational measure in a context characterized by severe limitations in official economic

statistics. Moreover, we take data from the VenRePS survey of Venezuelans entering Colombia to assess whether Venezuelans living along these border crossings became less likely to migrate once the refugee crisis unraveled. We employ three alternative definitions for the exposure to concentrated migration flows: First, we consider the proximity to Cúcuta, the Colombian border town through which most Venezuelans crossed into Colombia. Second, we consider the presence of official international border crossings, such as official bridges or roads. Finally, we consider the presence of both formal and informal transit routes.¹

Our results suggest that transit municipalities did better than other areas of the country after the start of the Venezuelan refugee shock in 2017. Event study analyses confirm balanced pre-treatment trends and provide a sense of the dynamics of treatment effects: While transit municipalities experienced an initial contraction in 2017, this pattern fully reversed by late 2018 and continued into the 2020s. Outmigration patterns follow a corresponding trend. Broadly, Venezuelans in border transit areas were less likely to migrate after the start of the refugee shock. However, event study results suggest an early increase in relatively outmigration from border areas that is only reversed in the second half of 2018. These findings broadly suggest that, facing the lowest migration costs, Venezuelans in border transit areas started migrating early in 2017, which had a negative impact on their local economies. However, as migrants from elsewhere in Venezuela start to arrive and concentrate in these border transit areas in 2018, the resulting economic opportunities for servicing migrants' service demands induced locals not to migrate at the rates experienced elsewhere in the country.

Research on transit migration emphasizes that migration is rarely a single move from an origin to a destination. The literature has challenged static and politically loaded definitions of “transit,” documented fragmented and stepwise journeys, and shown that migrants' intentions, legal status, and duration of stay can evolve along the route [Papadopoulou,

¹The Venezuelan/Colombian border extends for over 2,000 kilometers, and most of it is shaped by rivers separating both countries. On top of formal bridges, there are many informal crossings called *trochas*, some of which are overseen by organized criminal groups controlling bidirectional flows.

2005, Collyer, 2010, Düvell, 2012, Collyer and de Haas, 2012, Castagnone, 2011]. Yet the development effects of these movements on transit communities remain understudied. The most comprehensive recent assessment, Testa [2023], synthesizes qualitative fieldwork and secondary evidence from transit municipalities in four low- and middle-income countries, finding that migrant spending, work, and demand for transportation, accommodation, food, and other services may generate local income opportunities, often through informal markets. Building on this literature, our paper provides, to our knowledge, one of the first quasi-experimental estimates of the local economic effects of transit migration. By combining alternative measures of border transit exposure with nighttime lights and outmigration records, we test quantitatively whether the economic mechanisms identified in qualitative research are visible in the trajectories of border transit municipalities during a large refugee shock.

Our study connects the transit migration literature to research on regional economic resilience, which examines why some territories withstand, absorb, and recover from major economic shocks better than others [Simmie and Martin, 2010, Martin, 2012, Martin and Sunley, 2015]. This literature distinguishes between a region’s *resistance* to a shock, its subsequent *recovery*, and its capacity for *re-orientation*—the adaptive restructuring of local economic activity toward new sources of demand [Martin, 2012, Boschma, 2015]. Pre-existing economic structures and inherited capabilities critically condition these responses [Martin et al., 2016]. We bring this framework to an extreme and understudied setting: rather than asking how regions weather a recession, we ask whether exposure to concentrated migrant transit allowed border municipalities to re-orient economic activity—toward transportation, accommodation, and commerce serving migrants in transit—amid one of the deepest peacetime economic collapses on record.

The Venezuelan displacement crisis likewise has generated a rapidly expanding literature on both its origins and its consequences. Existing work links the exodus to Venezuela’s extraordinary economic and institutional collapse and documents substantial losses in eco-

economic activity and employment in the municipalities from which migrants departed [Bahar and Dooley, 2020, Cabra-Ruiz et al., 2024b]. A complementary body of research studies the receiving economies, especially Colombia, showing effects on informal wages and poverty, the labor-market consequences of large-scale regularization, and the vulnerability of Venezuelan migrants to violence and occupational downgrading [Caruso et al., 2021, Bahar et al., 2021, Knight and Tribin, 2023, Olivieri et al., 2022]. This paper connects these origin- and destination-focused literatures by examining an intermediate but economically consequential margin: what happened inside Venezuela in the municipalities through which the refugee border transit occurred. To our knowledge, existing work on the Venezuelan shock has not estimated how sustained migrant transit affected economic activity along transit routes linking Venezuelan refugees to the rest of the region.

The paper continues as follows: Section 1 describes our empirical setting. Section 2 presents our data and measures of interest. Section 3 introduces our difference-in-differences and event study empirical strategy. Section 4 outlines and interprets our empirical results. Section 5 concludes.

I Empirical Setting

Venezuela entered a period of severe economic contraction in early 2014, initiating one of the deepest economic and institutional crises in recent hemispheric history [Morales-Arilla, 2025]. Between 2013 and 2020, Venezuela’s economy contracted by more than 70 percent while inflation reached historically unprecedented levels [Abuelafia and Saboin, 2020, International Monetary Fund, 2022]. Simultaneously, institutional capacity weakened considerably, affecting the provision of healthcare, electricity, transportation, and public security. As the economy unraveled, Maduro’s regime took a decisively authoritarian and repressive turn in 2017 [Morales-Arilla and Abbott, 2024, Morales-Arilla and Traettino, 2024, Morales-Arilla, 2025]. In this context of economic erosion and democratic backsliding, migration became a

household survival strategy for millions of Venezuelans in general, and for regime opponents in particular [Morales-Arilla et al., 2025, Idrobo, 2025].

The Venezuelan refugee shock is one of the largest population outflows in contemporary Latin American history [Bahar et al., 2022]. By the end of 2020, more than five million Venezuelans had left the country according to United Nations High Commissioner for Refugees [2020]. Bahar and Dooley [2020] document that the largest migration flows occurred started in 2017, with neighboring countries such as Colombia, Peru, Chile, and Ecuador emerging as the principal destinations. Colombia became particularly important due to its 2,000 km long border with Venezuela, and its long-standing economic, cultural and historic ties to its “Sister Republic”. Beyond demographic implications, the refugee shock altered economic dynamics within Venezuela itself [Cabra-Ruiz et al., 2024a]. Migrants became particularly visible in border municipalities, where sustained population concentration induced informal economic activity and cross-border commercial networks [Euronews, 2018, Gestión, 2019]. The persistence of informal transportation networks, street vending, small-scale retail trade, and temporary service provision meant a local economic adaptation of border transit routes to the flow of migrants out of the country.

Venezuelans crossed into Colombia both through formal crossings through bridges or roads, but also through unofficial transit routes commonly referred to as *trochas*. These informal routes facilitated the movement of people and goods outside formal border infrastructure, particularly during episodes of tightened migration controls.² Chiefly, Cucuta became the main Colombian border city for Venezuelans to cross into and either look for permanent local accommodation or prepare the next steps of their journeys. Importantly, border transit areas inherited strong economic ties with Colombian border regions through retail trade, transportation services, currency exchange, and informal commerce. Consequently, border municipalities differed considerably in pre-existing levels of poverty, population den-

²Some of these *trochas* were controlled by criminal organizations. Reports by Human Rights Watch [2022] document incidents of violence and territorial disputes linked to armed groups operating in border regions during this period.

sity, political alignment and infrastructure quality in comparison to the rest of the country. Figure 1 shows a Map of Venezuelan municipalities, highlighting the location of Cúcuta, of the official border crossings and of documented unofficial *trochas* into Colombia.

II Data and Measurements

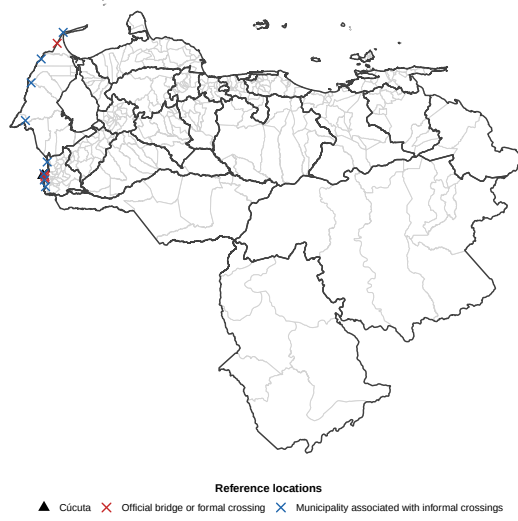
This study combines satellite-based nighttime light measures of economic activity and survey data about the local origins and timing of Venezuelan migrants into Colombia with administrative, geographic, political and demographic information to construct a monthly panel dataset of Venezuelan municipalities between 2016 and 2021. The unit of analysis is the municipality. Municipality boundaries are obtained from the [United Nations Office for the Coordination of Humanitarian Affairs, Venezuela \[2026\]](#). Municipalities are classified according to their degree of exposure to international migration corridors. Municipalities exposed to border transit routes are classified as such according to three alternative treatment definitions:

- Near Cúcuta: Municipality’s geographic centroid is within 50 km from the geographic centroid of Cúcuta’s municipality in Colombia.
- Formal crossing: Municipality holds at least one formal border crossing with Colombia.
- Any crossing: Municipality holds at least one formal or documented informal border crossing with Colombia.

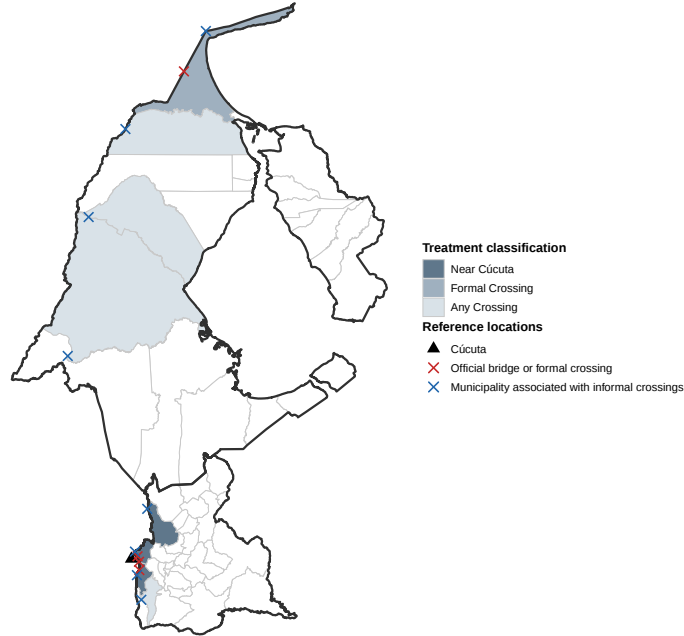
The primary outcome variable in our study is nighttime light intensity, which serves as a proxy for local economic activity. Nighttime light intensity has been widely used in the literature as a reliable proxy for economic activity, particularly in contexts where official statistics are limited, delayed, or unreliable [[Henderson et al., 2012](#)].³ Nighttime lights data

³In the Venezuelan case, the deterioration of statistical capacity during the crisis period makes satellite-based measures especially suitable for capturing spatial and temporal variation in local economic dynamics. In this context, variations in satellite-based luminosity measures can be interpreted as reflecting changes in local economic activity.

Figure 1: Venezuelan Municipalities and Border Transit Exposure



(a) Venezuelan Municipalities



(b) Treated Areas

Notes: The figure maps the three definitions of exposure to concentrated migrant transit used in the empirical analysis. “Near Cúcuta” identifies Venezuelan municipalities whose geographic centroids lie within 50 kilometers of the centroid of Cúcuta, Colombia. “Formal crossing” identifies municipalities containing at least one official international bridge or road crossing into Colombia. “Any crossing” additionally includes municipalities containing a documented informal crossing, locally known as a *trocha*. Municipal boundaries are from OCHA’s administrative boundary data for Venezuela. Crossing locations are assigned to municipalities using their geographic coordinates.

are obtained from the Visible Infrared Imaging Radiometer Suite (VIIRS) Day/Night Band, produced by the National Oceanic and Atmospheric Administration (NOAA). Monthly, grid-level observations from [Elvidge et al. \[2021\]](#) are aggregated within municipal boundaries to produce the monthly panel of local nighttime lights. To mitigate the influence of extreme values, the analysis uses the logarithm of local nighttime light intensity.

Moreover, we compare outmigration rates from different municipalities before and after the explosion of the refugee crisis.⁴ For this purpose, we leverage the VenRePS dataset [[Ibáñez et al., 2021](#)]. VenRePS is a longitudinal survey of Venezuelan forced migrants in Colombia that contains information on migrants’ date of entry to Colombia and their Venezuelan place of origin. This allows us to construct a monthly panel of municipality outflows between 2016 and 2018.⁵ To mitigate the influence of extreme values while preventing the loss of observations with 0 monthly outflows for a specific municipalities, our analyses use the inverse hyperbolic sine of the number of outflows [[Bellemare and Wichman, 2020](#)].

Additional municipal-level covariates are incorporated to account for pre-existing structural differences that may influence local economic trajectories. These include measures of population density, baseline poverty levels, political alignment prior to the migration shock, and distance to the Colombian border.⁶ Population and poverty indicators are drawn from the 2011 Venezuelan population census from the *Instituto Nacional de Estadística* (INE, the national statistical agency), while political alignment is proxied using the municipal-level Chavista vote share in the 2013 presidential election as reported by the *Consejo Nacional Electoral* (CNE, the national electoral authority). These variables are included to account for territorial heterogeneities that could confound the relationship between border transit exposure and local economic activity.

The final dataset constitutes a balanced monthly panel of municipalities covering the

⁴While the rate of migration accelerated drastically in 2017, there was an earlier and slower flow of migrants going on since at least 2014. See [Bahar et al. \[2022\]](#).

⁵Unfortunately, the VenRePS dataset only has information about Venezuelan entries into Colombia up to the end of 2018, so the nighttime lights and migration month-municipality panels only overlap for the 2016-2018 period.

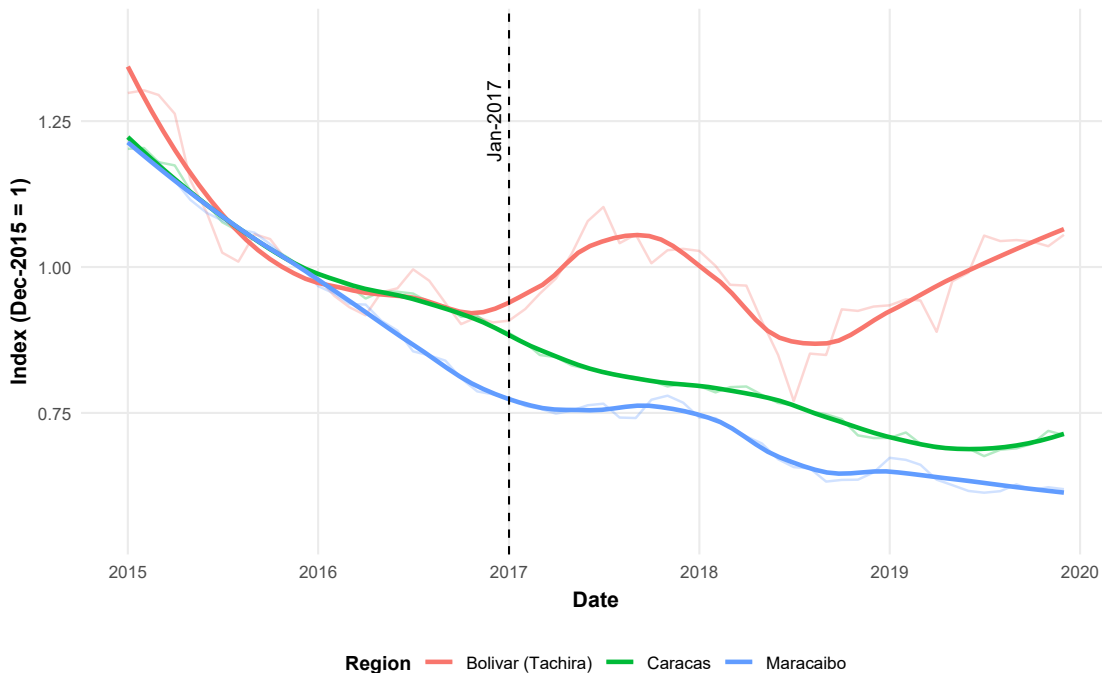
⁶Data for these municipality-fixed covariates was taken from [Morales-Arilla \[2025\]](#).

period between January 2016 and December 2021. The pre-treatment period includes months prior to the sharp intensification of migration flows, while the post-treatment period captures the peak years of transit migration and border reorganization. This structure enables the analysis of both aggregate and period-specific effects of border transit exposure on local economic activity and migration rates across Venezuelan municipalities. Table [A.1](#) provides summary statistics for all variables considered in the study.

III Empirical Strategy

Our empirical approach compares the evolution of economic and migration outcomes between corridors to estimate the local economic effects of transit migration in Venezuela. Figure 2 shows the evolution of an index of nighttime lights comparing the border municipality of Bolivar in the Tachira state to Caracas and Maracaibo, the two most important cities in the country. The figure shows how while economic activity was collapsing in all three municipalities, this trend reversed in the Bolivar municipality of Tachira once the refugee crisis unraveled in 2017. This stylized finding is consistent with the view that the growing concentration of refugees in helped sustain economic activity in border transit areas in the face of the country’s macroeconomic collapse.

Figure 2: Nighttime-Lights in a Border Transit Municipality and Major Venezuelan Cities



Notes: The figure compares the evolution of nighttime-light radiance in Bolívar municipality in Táchira, a major border transit area, with Caracas and Maracaibo, Venezuela’s two largest urban economies. Each series is normalized to a common pre-treatment baseline so that the figure emphasizes relative changes rather than differences in initial luminosity levels. The vertical reference line marks January 2017, when the large acceleration of Venezuelan outward migration begins. Nighttime-light data are monthly VIIRS Day/Night Band observations aggregated to municipal boundaries.

To formally test the hypothesis that border transit areas outperformed other areas of the country at the onset of the refugee crisis, we perform a difference-in-differences specification that compares changes in economic activity and migration outcomes between border transit and non-border transit municipalities. Border transit municipalities are classified according to the three definitions outlined above. The post-treatment period is operationalized as starting on January 2017. Our baseline empirical analysis is estimated using the following regression specification:

$$Y_{it} = \beta (Transit_i \times Post_t) + X_{it}\gamma + \mu_i + \tau_t + \varepsilon_{it} \quad (1)$$

where Y_{it} denotes the logarithm of total nighttime light intensity in municipality i and

year t . The variable $Transit_i$ captures whether a municipality is classified as a border transit area, while $Post_t$ is an indicator equal to one for months after January 2017 and zero otherwise. The vector X_{it} includes municipality-fixed controls interacted with the $Post_t$, intended to account for outcome changes around observable structural differences across different municipalities, including population density, baseline poverty levels, political alignment, and geographic proximity to the Colombian border. μ_i and τ_t indicate municipality and month fixed effects and ϵ_{it} is the error term. Standard errors are calculated allowing for within-municipality correlation in errors over time. The coefficient of interest, β , measures the percent change in nighttime luminosity or migration flows in border transit areas relative to non-border transit areas.

β would capture the economic resilience effect of migration on border transit areas under the identifying assumption that, absent refugee flows, economic and migration outcomes in border transit and non-border transit areas would have evolved evenly. We leverage an event-study framework evaluate the plausibility of this parallel-trend assumption before 2017, along with the dynamic effects on border transit areas in different periods after the refugee crisis unraveled. This event-study specification is estimated as follows:

$$Y_{it} = \alpha + \sum_{k \neq -1} \beta_k (Transit_i \times 1[t = k]) + \sum_{k \neq -1} X_{i,k} \gamma_k + \mu_i + \tau_t + \epsilon_{it} \quad (2)$$

where $1[t = k]$ is an indicator for period k , vector $X_{i,k}$ includes municipality-fixed controls interacted with the $1[t = k]$. Because treatment starts on January 2017, we consider December of 2016 as our reference period ($k = -1$). The β_k coefficients capture period specific differences in outcomes between transit and non-transit areas relative to December of 2016. We test the plausibility of the parallel trend assumption through pre-treatment estimates in 2016, which should be statistically indistinguishable from 0 if transit and non-transit areas were moving in parallel trends before the start of the refugee crisis. Importantly, we evaluate the dynamics of treatment effects with period-specific estimates starting in January of 2017.

IV Results

This section presents the empirical evidence on the relationship between exposure to international migration corridors and local economic activity and migration outcomes across Venezuelan municipalities.

IV.1 Nighttime lights

Table 1 presents difference-in-differences estimates of β from Equation 1 for the three different treatment definitions, iterating by the exclusion or inclusion of the battery of controls mentioned above. Overall, results suggest that transit areas enjoyed a 10-15% benefit in terms of nighttime lights in comparison to non-transit areas after the start of the country's refugee shock.

Table 1: Nighttime Lights Difference-in-Differences Analyses

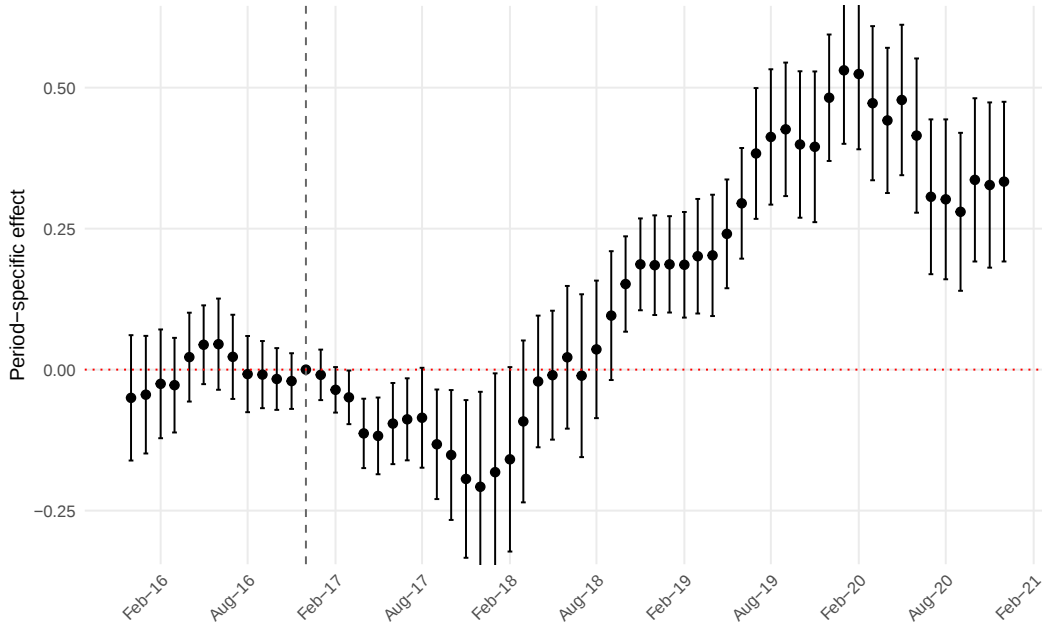
	Without Controls			With Controls		
Post $\times$ Near Cúcuta	0.120***			0.157***		
	(0.016)			(0.060)		
Post $\times$ Formal Crossing	0.104***			0.118**		
	(0.021)			(0.054)		
Post $\times$ Any Crossing	0.105***			0.114**		
	(0.040)			(0.053)		
Observations	19,923	19,923	19,923	19,923	19,923	19,923
R^2	0.994	0.994	0.994	0.994	0.994	0.994
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	No	No	Yes	Yes	Yes
SE clustering	Mun	Mun	Mun	Mun	Mun	Mun

Notes: The dependent variable is the logarithm of monthly nighttime-light radiance. Each column reports a separate difference-in-differences regression using the indicated definition of exposure to migrant transit. Near Cúcuta identifies municipalities whose geographic centroids lie within 50 kilometers of Cúcuta, Colombia. Formal Crossing identifies municipalities containing at least one official border crossing into Colombia. Any Crossing additionally includes municipalities containing a documented informal crossing, locally known as a *trocha*. The post-treatment period begins in January 2017. All specifications include municipality and month fixed effects. Controlled specifications additionally include interactions between the post-treatment indicator and pre-treatment municipal characteristics: log distance to Cúcuta, poverty, population density, and pro-government vote share. Standard errors, reported in parentheses, are clustered at the municipality level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Figure 3 presents event study estimates of the β_k coefficients introduced in Equation 2 for the Near Cúcuta treatment definition and including controls. The figure confirms parallel pre-treatment trends between border transit and non-border transit areas. Interestingly, the figure shows a non-monotonic pattern in the dynamic effects of the refugee shock on transit routes. During all of 2017, it seems that border transit areas underperform the

rest of the country. However, this pattern reverses in early 2018 such that, by second half of the year, border transit areas outperform non-transit areas by about 20%. This pattern continues all through 2019 and until the first half of 2020, with differences attenuating mildly thereafter. Figures A.1 and A.2 provide estimates for the same specifications but looking at the formal crossings and all crossings treatment definitions, with conclusions being virtually indistinguishable.

Figure 3: Nighttime lights Event Study Analysis



Notes: The figure reports event-study estimates of the interaction between the “Near Cúcuta” treatment indicator and month indicators, based on Equation 2. The omitted reference period is December 2016. The dependent variable is the logarithm of monthly nighttime-light radiance. The specification includes municipality and month fixed effects and interactions between month indicators and pre-treatment municipal characteristics: log distance to Cúcuta, poverty, population density, and pro-government vote share. Points denote coefficient estimates; vertical bars denote 95 percent confidence intervals. Standard errors are clustered at the municipality level. The vertical reference line marks January 2017, the beginning of the post-treatment period.

IV.2 Local migration

Same as above, Table 2 focuses on local monthly migration rates to estimate the value of β according to the specifications in Equation 1. In this case, all coefficients are negative -

that is, we see less migration into Colombia from border transit municipalities after the start of the refugee crisis. While estimates are not statistically significant for the Near Cúcuta and Formal Crossing definitions, it is so for the Any Crossing definition. Estimates suggest that border transit areas experienced 8-15% less migration than non transit areas after the refugee crisis unraveled.

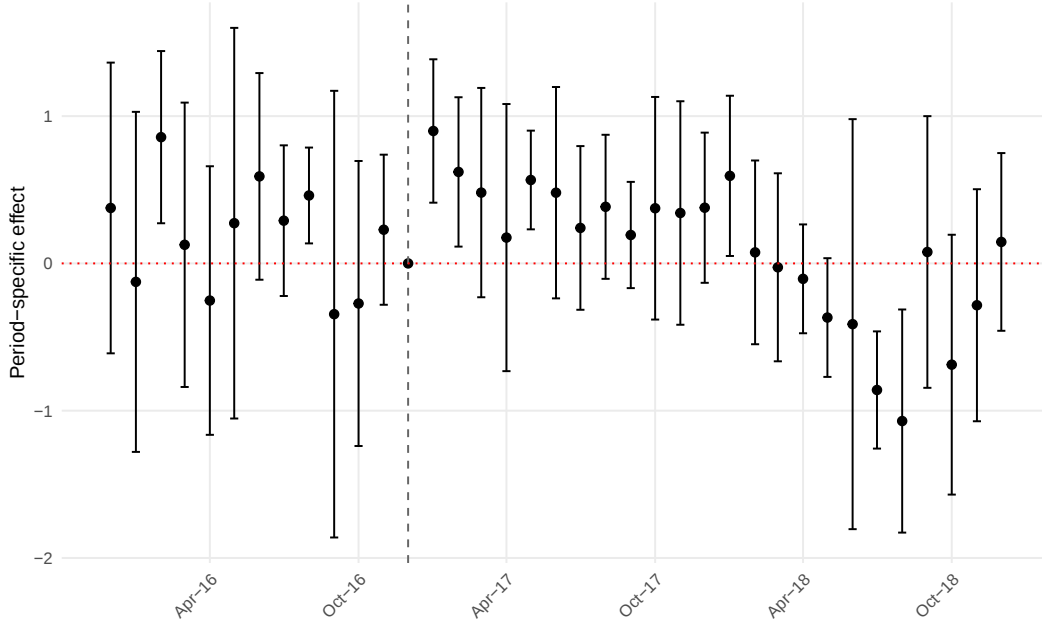
Table 2: Local Migration Difference-in-Differences Analysis

	Without Controls			With Controls		
Post $\times$ Near Cúcuta	−0.088			−0.078		
	(0.148)			(0.105)		
Post $\times$ Formal Crossing	−0.162			−0.082		
	(0.129)			(0.078)		
Post $\times$ Any Crossing			−0.238***			−0.145**
			(0.087)			(0.061)
Observations	12,395	12,395	12,395	12,395	12,395	12,395
R^2	0.853	0.853	0.853	0.856	0.856	0.856
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	No	No	Yes	Yes	Yes
SE clustering	Mun	Mun	Mun	Mun	Mun	Mun

Notes: The dependent variable is the inverse hyperbolic sine of the monthly number of Venezuelan migrants entering Colombia, classified by municipality of origin. Each column reports a separate difference-in-differences regression using the indicated definition of exposure to migrant transit. Near Cúcuta identifies municipalities whose geographic centroids lie within 50 kilometers of Cúcuta, Colombia. Formal Crossing identifies municipalities containing at least one official border crossing into Colombia. Any Crossing additionally includes municipalities containing a documented informal crossing, locally known as a *trocha*. The post-treatment period begins in January 2017. All specifications include municipality and month fixed effects. Controlled specifications additionally include interactions between the post-treatment indicator and pre-treatment municipal characteristics: log distance to Cúcuta, poverty, population density, and pro-government vote share. Standard errors, reported in parentheses, are clustered at the municipality level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Finally, Figure 4 presents event study estimates β_k from Equation 2 considering the Near Cucuta treatment definition and the set of controls defined above. We confirm parallel pre-treatment trends. Moreover, we see a corresponding pattern to the event study figure for nighttime lights: While there seems to be a positive effect of outmigration in 2017, this pattern seems to start to revert in January of 2018 such that, by the second half of 2018, outmigration in non-transit areas exceeds that of transit areas substantially. Figures A.3 and A.4 replicate this specification looking at the formal crossings and all crossings treatment definitions, essentially confirming the patterns described above.

Figure 4: Local Migration Event Study Analysis



Notes: The figure reports event-study estimates of the interaction between the “Near Cúcuta” treatment indicator and month indicators, based on Equation 2. The omitted reference period is December 2016. The dependent variable is the inverse hyperbolic sine of monthly entries into Colombia, measured by Venezuelan municipality of origin. The specification includes municipality and month fixed effects and interactions between month indicators and pre-treatment municipal characteristics: poverty, population density, and pro-government vote share. Points denote coefficient estimates; vertical bars denote 95 percent confidence intervals. Standard errors are clustered at the municipality level. The vertical reference line marks January 2017, the beginning of the post-treatment period. The VenRePS data cover entries into Colombia only through the end of 2018.

Taken together, the evidence suggests that transit border areas became relatively econom-

ically resilient after the unraveling of the Venezuelan refugee shock, which in turn attenuated the rate of outmigration by locals in those areas. The non-monotonic dynamics we document map closely onto the analytical distinctions drawn in the regional resilience literature [Martin, 2012, Martin and Sunley, 2015]. Border transit municipalities initially exhibited *low resistance* to the refugee shock: facing the lowest migration costs, their residents were the first to leave, deepening the local contraction relative to the rest of the country throughout 2017. Their subsequent outperformance, however, did not reflect a return to the pre-shock growth path, but rather a process of adaptive *re-orientation* [Boschma, 2015]: as migrants from the interior concentrated along the corridor, local economies restructured toward servicing transit demand—transportation, lodging, food, and informal cross-border commerce. Consistent with the view that inherited economic structures condition regional adaptability [Martin et al., 2016, Boschma, 2015], these municipalities’ long-standing cross-border commercial networks plausibly supplied the capabilities upon which this re-orientation was built. From this perspective, the resilience of Venezuela’s border transit economies was an active reconfiguration of local activity around the one source of demand the crisis itself generated.

V Conclusion

This article examined how local economic activity and migration patterns evolved in border transit areas of Venezuela after the unraveling of the country’s refugee crisis in 2017. Leveraging satellite-based nighttime light data and survey data on local migration rates, we find that local economies in border transit areas were relatively resilient to the country’s macroeconomic collapse, which in turn attenuated migration rates from these areas. We document a non-monotonic sequence suggestive of initial low resistance followed by adaptive re-orientation: As their residents faced the lowest costs of leaving, border transit areas initially experienced higher outmigration rates that induced a deeper economic contraction; yet as migrants from the rest of the country concentrated along the corridor, border tran-

sit economies reorganized around the demand for lodging, transportation, and other services that the exodus itself generated, sustaining local economic activity and attenuating residents' incentives to leave.

Our evidence contributes to the regional resilience and migration literature by showing that, even under conditions of prolonged economic collapse and institutional fragility, certain areas can partially absorb aggregate shocks through migration-related economic adaptation. The source of resilience we identify is distinctive: border transit economies adapted to benefit from a mobile source of demand passing through them. The local effects of mass migration thus depend partly on a territory's position between refugees' origins and the safe havens they seek. Entrepôts close to major transit hubs enjoy improved adaptation opportunities relative to other regions subjected to the same macroeconomic and institutional shocks. Whether resilience built on transit demand can outlast the flows that generate it remains an open question for future research.

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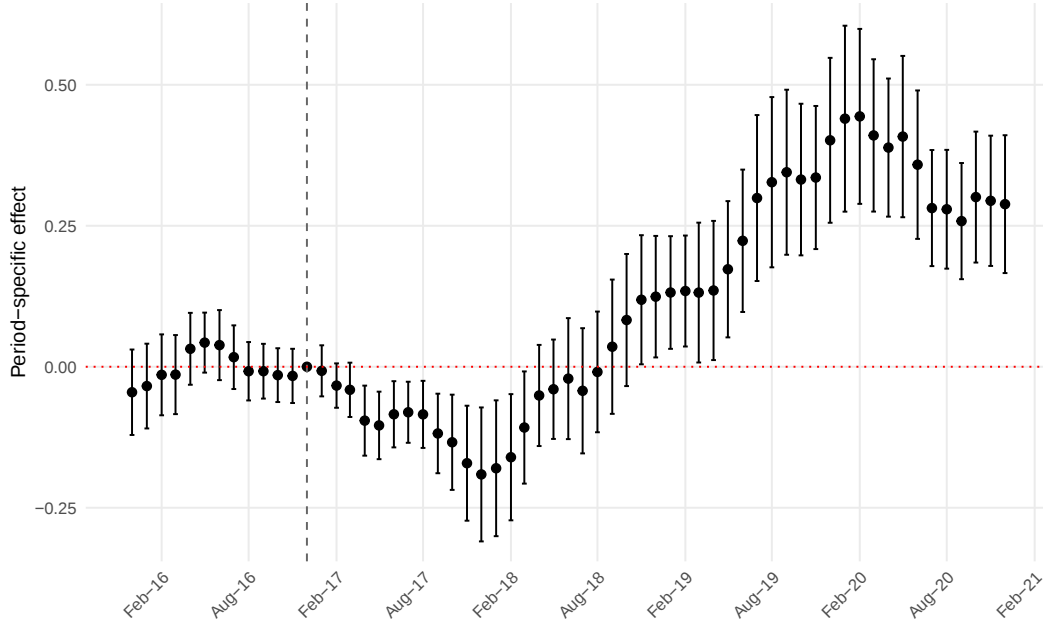
Appendix

Table A.1: Summary Statistics

Variable	Observations	Mean	Std. Dev.	Minimum	Maximum
Log nighttime-light radiance	19 923	−0.93	2.28	−12.25	6.91
Monthly entries into Colombia	12 395	34.55	220.37	0.00	9705.00
Near Cúcuta	19 923	0.01	0.10	0.00	1.00
Formal crossing	19 923	0.01	0.11	0.00	1.00
Any crossing	19 923	0.03	0.16	0.00	1.00
Poverty rate (2011)	19 923	0.20	0.06	0.03	0.55
Population density (2011)	19 923	281.85	677.12	0.06	5383.04
Log driving distance to Cúcuta	19 923	13.27	0.80	10.19	15.11
Pro-government vote (2013)	19 923	0.56	0.12	0.17	0.91

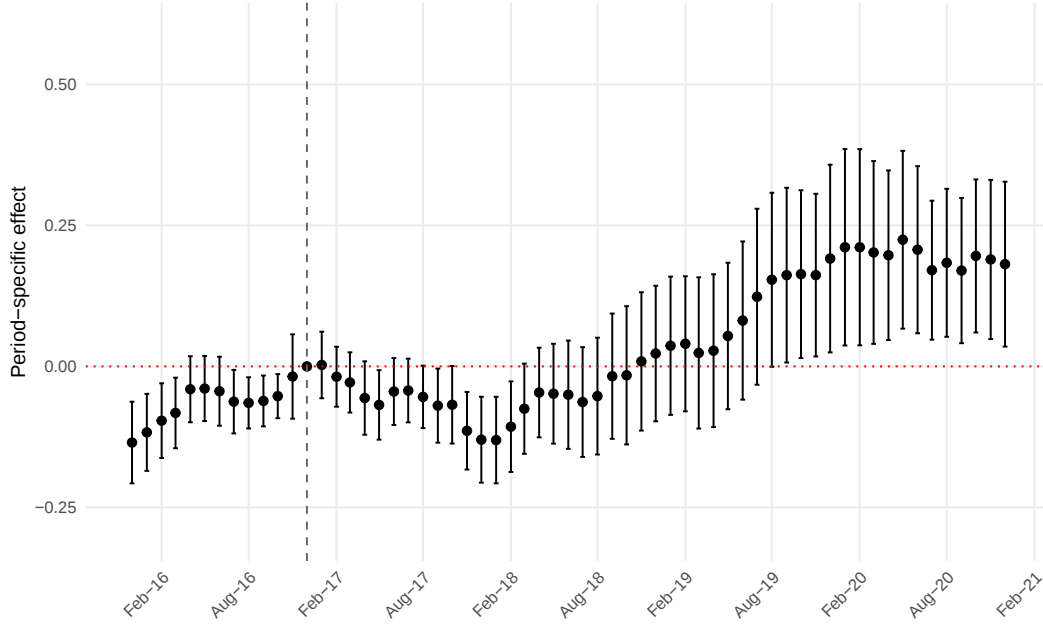
Notes: The table reports summary statistics for the municipality-month observations used in the analysis. Log nighttime-light radiance is constructed from monthly VIIRS Day/Night Band data aggregated to Venezuelan municipal boundaries. Near Cúcuta is an indicator for municipalities whose geographic centroids lie within 50 kilometers of Cúcuta, Colombia. Formal crossing is an indicator for municipalities containing at least one official border crossing into Colombia. Any crossing is an indicator for municipalities containing at least one formal or documented informal crossing into Colombia. Poverty, population density, and pro-government vote share are measured prior to the refugee shock. Monthly entries into Colombia denotes the number of Venezuelan migrants entering Colombia in a given month, classified by Venezuelan municipality of origin.

Figure A.1: Event Study of Nighttime lights: Formal Crossings



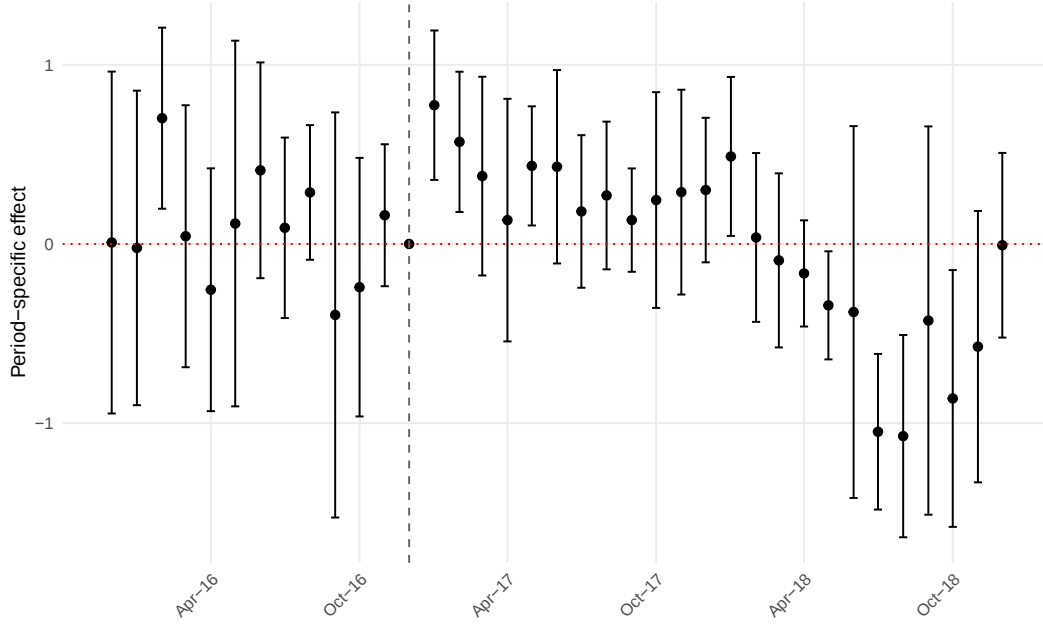
Notes: The figure reports event-study estimates of the interaction between an indicator for municipalities containing a formal border crossing and month indicators. The omitted reference period is December 2016. The dependent variable is the logarithm of monthly nighttime-light radiance. The specification includes municipality and month fixed effects and interactions between month indicators and pre-treatment municipal characteristics: log distance to Cúcuta, poverty, population density, and pro-government vote share. Points denote coefficient estimates; vertical bars denote 95 percent confidence intervals. Standard errors are clustered at the municipality level. The vertical reference line marks January 2017.

Figure A.2: Event Study of Nighttime lights: Any Crossings



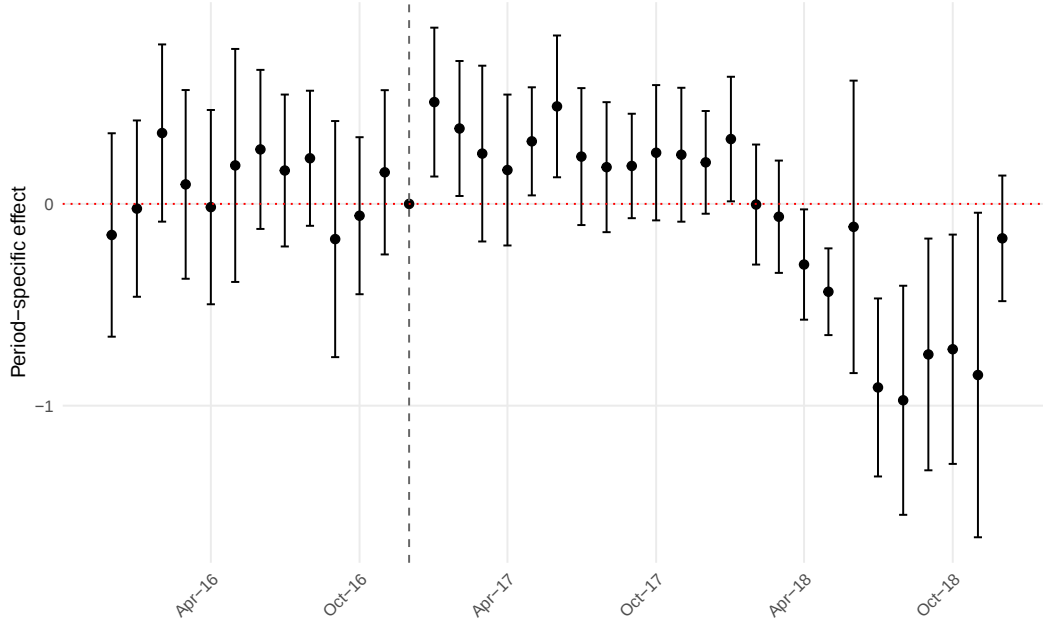
Notes: The figure reports event-study estimates of the interaction between an indicator for municipalities containing any formal or documented informal border crossing and month indicators. The omitted reference period is December 2016. The dependent variable is the logarithm of monthly nighttime-light radiance. The specification includes municipality and month fixed effects and interactions between month indicators and pre-treatment municipal characteristics: log distance to Cúcuta, poverty, population density, and pro-government vote share. Points denote coefficient estimates; vertical bars denote 95 percent confidence intervals. Standard errors are clustered at the municipality level. The vertical reference line marks January 2017. Informal crossings are locally known as *trochas*.

Figure A.3: Event Study of Local Migration: Formal Crossings



Notes: The figure reports event-study estimates of the interaction between an indicator for municipalities containing a formal border crossing and month indicators. The omitted reference period is December 2016. The dependent variable is the inverse hyperbolic sine of monthly entries into Colombia, measured by Venezuelan municipality of origin. The specification includes municipality and month fixed effects and interactions between month indicators and pre-treatment municipal characteristics: poverty, population density, and pro-government vote share. Points denote coefficient estimates; vertical bars denote 95 percent confidence intervals. Standard errors are clustered at the municipality level. The vertical reference line marks January 2017. The VenRePS data cover entries into Colombia only through the end of 2018.

Figure A.4: Event Study of Local Migration: Any Crossings



Notes: The figure reports event-study estimates of the interaction between an indicator for municipalities containing any formal or documented informal border crossing and month indicators. The omitted reference period is December 2016. The dependent variable is the inverse hyperbolic sine of monthly entries into Colombia, measured by Venezuelan municipality of origin. The specification includes municipality and month fixed effects and interactions between month indicators and pre-treatment municipal characteristics: poverty, population density, and pro-government vote share. Points denote coefficient estimates; vertical bars denote 95 percent confidence intervals. Standard errors are clustered at the municipality level. The vertical reference line marks January 2017. Informal crossings are locally known as *trochas*. The VenRePS data cover entries into Colombia only through the end of 2018.