The (Ir)relevance of Borders in an Era of Increased Human Mobility

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Abstract

Governments allocate significant resources to control and secure their borders. While many such efforts occur within a country's home territory, in the context of human migration, several initiatives involve migration policy externalization---or states pursuing policies designed to incentivize downstream neighbors to control and limit migration flows. In this paper we situate these efforts to secure the border within the context of increased human mobility and then evaluate the efficacy of such externalization efforts by analyzing migration flows at two key corridors in the Western Hemisphere: through the Panamanian Darien Gap and into the US through its southern border and Caribbean sector. Specifically, we investigate how externalized migration restrictions measured by changes in visa policies shape the flow of migrants through these routes. Our empirical analysis leverages a series of two-stage exponential hurdle count models that account for both selection and simultaneous error covariance between models. Our results paint a nuanced view of externalization policy efforts: rather than stopping migration outright, these policies tend to deflect migrants onto new routes which they take to navigate toward their intended destinations. We complement these empirical findings with an exploration of US efforts to externalize migration policy aimed at curtailing migration from Cuba and Venezuela. We conclude with a discussion on how these results suggest the emergence of migration triangle through the Darian Gap, Central America, and the Caribbean.

01 – Introduction

Human migration is nothing new. It matters not whether migrants are "pushed" or "pulled"; nor does it matter whether those migrating are children, single individuals or family units. Politicians and political candidates weaponize the issue to mobilize their constituents, draw in new supporters, and/or highlight stark comparisons with their opponents as immigration across both material/economic and identity/cultural dimensions (Scheve and Slaughter 2001; Sides and Citrin 2007; Hainmueller and Hiscox 2010). More recently, the clarion cry of "open borders" has prompted undocumented migration to be cast as a national security issue as well (Cordero, et al 2023).

Despite the rising volume of anti-immigrant rhetoric, it is important to foreground that as of 2020, only a little over three percent of the world's population live outside their country of birth (World Bank Group 2022). Scholarly literature tends to focus on legal immigration; immigration that is driven largely by a desire to increase wages as well as political opportunities (Fitzgerald, Leblang, and Teets, 2014). But labor migrants account for only a sliver of those who cross borders; a large—and increasing—number of individuals cross borders without legal documents and/or attempt to enter a new country to claim asylum. Consider that in 2023, 875,000 migrants entered the United States through legal channels while almost a million individuals claimed asylum at ports of entry and over two million where apprehended attempting to enter the US between ports of entry on the US southern border.

Although the border has been characterized by some as the *sine qua non* of state autonomy and national identity (Herz 1957; Baud and Van Schendel1997), the border is exceedingly difficult, if not impossible, to completely seal. Traditional tools of economic statecraft such as foreign aid and trade may do more to increase migration flows (e.g., Clemens and Postel 2018; Bermeo and Leblang 2015). Other efforts to decrease immigration via the construction of border fortifications or the use of deportation as deterrence have likewise proven ineffective (Avdan, Rosenberg, and Gelpi 2024; Schon and Leblang 2022). The limited success of both domestic and foreign policy tools to manage migration pressure has led countries to adjust what Simmons and Kenwick (2022) refer to as their "border orientation," the state's "authoritative and spatial display of its capacities to control the terms of penetration of its national borders." In practice, this means extending the destination state's administrative and/or territorial boundaries outward; to move or relocate border control to migrant origin or migrant transit countries (Jaulin, et al 2020).

Is this change in border orientation effective especially after the end of COVID-19 related travel restrictions? Does widening a nation's regulatory and administrative border decrease or deter unwanted immigration? Using a combination of statistical models and case studies, we examine the effect and effectiveness of changing border orientation on immigration flows. Theoretically, we marry perspectives from literatures on state autonomy and statecraft with a practical question: do efforts of migrant destination countries to externalize migration control to neighboring countries deter migrants, particularly those leaving countries experiencing economic and political deprivation, armed conflict, or climate change?

We address these questions by focusing on unauthorized immigration to the United States and through the Western Hemisphere over a four-year period from December 2019 through December 2023. Focusing on the US allows us to observe changing trends in immigration from a period of migratory stagnation due to the COVID-19 pandemic, to increased mobility as migration restrictions

were gradually lifted. Importantly, north-bound migration through the Western Hemisphere after 2020 showed a large increase in movement through the Darien Jungle; we use geography to explore the effect of externalization on both spatial (geographic) and temporal deflection of migrants.

Operationally, we use visa restrictions as a measure of externalization. The issuance of visas in consular offices abroad—a process that essentially offshores the border to the traveler's country of origin—rather than at a destination country's borders—is an observable but perhaps innocuous means of controlling migration (Zolberg 1997). Yet, visa requirements demonstrably and measurably decrease flows of individuals seeking to enter a country (Czaika and de Haas 2017; Cope and Leblang 2023). Importantly, in recent years, countries in the Western Hemisphere have adjusted their visa requirements to decrease entry by those whom they fear will not leave if admitted (Amaral 2023).

Our findings are sobering for traditional theories of territorial control: once emigration from a home country has begun, altering the behavior of transit countries is of limited use. We find that changing border orientations may delay (temporal deflection) migration or alter the geography of migration (route/spatial deflection), but it does not stop movement. From this perspective, we demonstrate that migration in the 2020s is much like capital mobility in the early part of the century: it calls into question the power of national governments to effectively exert control over the macro-economy (Keohane and Milner 2010).

We situation our argument in the existing literature on migration, statecraft, and externalization in the next section. In section 3 we propose a theory on the relationship between externalization and migrant encounters based on the strategic calculations of aspiring migrants: owing to how migrants weight the costs of remaining in their home countries versus undertaking migration, we argue that externalized migration restrictions imposed in transit countries deflect rather than deter potential migrants; this section articulates differences between temporal and spatial deflection. To test our hypotheses, section 4 introduces our novel data sources on monthly irregular migrant encounters at three key migration corridors in the Western Hemisphere: the US southern border, the US Caribbean sector, and in the Panamanian Darian Gap. Section 4 also describes the quantitative methodology used to evaluate our hypotheses. Section 5 discusses our empirical results while section 6 evaluates our findings in the context of the specific cases of Mexico and Nicaragua. Finally, Section 7 concludes and provides discussion of the policy implications of this research given the limitations of externalized migration policy.

02 – Migration, Borders, and Externalization

The limited effectiveness of these traditional modes of statecraft – development assistance and border fortifications – to decrease or deter unwanted migration has led policymakers to devise strategies that stretch their sovereign borders outwards. Australia and members of the European Union, for example, seek to engage both origin and transit countries as partners in the effort to deter unwanted migration (FitzGerald 2019; Laube 2021; Jaulin et al. 2020). This use of third country agreements increased during the Syrian refugee crisis in 2015 motivated, in part, by the EU countries obligations under both UN and EU law governing the processing of asylum seekers. The principles embodied in the 1951 Refugee Convention and the 1967 Protocol require countries to assess whether the individual has a credible claim that they are fleeing persecution and/or violence.

Preventing those seeking asylum from reaching national borders absolved destination countries—in theory at least—of a legal obligation to evaluate their asylum claim.

The Syrian case is one example of a trend that has been apparent over the last two decades as the EU has increasingly used the carrot of visa liberalization – visa free travel – to encourage third countries to strengthen their border controls. These efforts, however, have not always been successful as transit countries have their own preferences. In 2018, for example, the EU offered 30 million euros and a liberalized readmission agreement to Morocco in exchange for increase costal surveillance to prevent irregular migrants from arriving in Spain. Morocco, holding out for free entry of its citizens into the EU, declined, and the agreement failed (Carrera et al., 2016; Laube, 2019).

Externalization efforts have been less common in the Western Hemisphere as the United States has prioritized a model of interior enforcement—immigration policies such as workplace enforcement along with deportations—along with border security over multi- and/or bi-lateral agreements (Manjívar, 2014). This changed dramatically in 2017 when the Trump administration introduced a policy called Remain in Mexico which required asylum seekers to wait in Mexico while their applications where processed. The Administration then began pursing similar deals with Guatemala, El Salvador, and other countries that were either countries of origin or countries of transit for those attempting to enter US territory. It is likely that these bilateral efforts would have continued; the declaration of Title 42 in March of 2020 shut down the US border, making other bilateral accords irrelevant.

The unwinding of COVID-19 travel restrictions around the world, pent up emigration demand, and ongoing economic, environmental, and violent events around the globe led to a rapid increase in efforts to enter the US via its southern border – see Figure 01 which uses our data to provide an overview of encounters at the US southern border and in the Darian Gap. What is striking is that arrivals on the US southern border no longer originate primarily from Central and South America; now individuals seeking the US as a destination are coming from around the world and traveling longer distances on average while using South America as an entry point into the Western Hemisphere.

[Figure 01 – Arrivals]

The Biden Administration redoubled bilateral efforts to lock down the border but with a twist. Rather than simply induce countries to limit or restrict entry, the US began to ask/direct/convince other countries in the region to change their visa policies vis-a-vis third countries. Consider the case of Mexico. A decade ago, Venezuelans could fly visa-free to all but nine of the countries between their country and the United States (the exception being El Salvador). Visa restrictions on Venezuelans were introduced by Nicaragua (2016), Panama (2017), and Guatemala (2018), but none of the restrictions impacted the short visa-free flight path from Venezuela to Mexico en route to the United States. However, in a two-month period in early 2022, the remaining countries in Central America and Mexico introduced visa restrictions *for* Venezuelans, starting with Mexico in January 2022, followed by Belize (January 2022), Costa Rica (February 2022), and Honduras (February 2022).[1]

[1] This regional shift was influenced by the Biden administration: Reuters reported that US “efforts to lobby Mexico to tighten entry requirements from OPEC member Venezuela had increased since Venezuelan arrivals jumped" during the summer of 2021 (Reuters, 2021). As noted by Human Rights Watch (HRW 2022):

Visa restrictions have been a clear way to introduce obstacles to the migration journey *en route* to the US-Mexico border, and they have been introduced for a variety of nationalities. In addition to barriers aimed at decreasing the number of Venezuelans arriving through Mexico, Haiti, Nicaragua, and Cuba have also faced visa restrictions erected in recent years to deter flights and easy migration routes (see Amaral, 2023). Cubans, for example must present visas to travel to all but two countries in the contiguous Americas (Nicaragua and Guyana); Cubans now use Nicaragua as a primary entry point into Central America before embarking on an overland route to the US-Mexico border. Given the frosty relationship between the United States and Nicaragua, the Biden administration has little chance of successfully convincing Nicaragua to adopt visa restrictions for Cubans, effectively halting the externalized border there. But for many other nationalities across the globe, the US border reaches as far south as Panama.

The data in Figure 01 clearly shows a rapid growth in demand for entry at the southern border of the United States despite increasing bilateral efforts to restrict mobility via visa controls. This limitation of state capacity — an inability to stymie the flow of migrant arrivals — suggests that migrants do not perceive restrictive measures implemented by states as deterrents, but rather as obstacles to avoid. In the following section we provide a theory to explain limitations of states' efforts to externalize their migration policy by centering externalization efforts within the context of human mobility.

03 – Theory

Relative to remaining at home, migration represents a costly action for individuals and families. For most, the cost of migration prevents even consideration of a potentially dangerous migration journey given the weight and strength of local social and cultural connections (Debray, Ruyssen, and Schewel 2023). For the vast majority of individuals, therefore, migration is a last resort especially when that migration requires transit over rough terrain and/or through multiple countries and when it occurs outside of formalized legal channels. Policymakers work to incentivize their neighbors to implement more restrictive immigration policies in an attempt to curtail or limit irregular migration at their borders. To work, these policies need to meaningfully increase the costs of migration for aspiring migrants to deter their choice to migrate.

Does extending the border actually work to decrease unwanted irregular migration? If these efforts produce the intended results, more restrictive immigration policies implemented in transit regions downstream of destination countries would reduce the number of irregular migrants encountered at the borders of those destination countries. Destination countries, such as the United States, in theory, can apply pressure to incentivize downstream neighbors, such as Mexico, to restrict access

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> In a May 2022 US Senate hearing, a State Department official said that, when the US sees an increase in people of a certain nationality arriving at the southern border, it communicates that information to governments in the region to 'look for areas of partnership.' Countries may then decide `through their own sovereign decision-making process . . . to impose visas on those nationalities to make sure that those who are arriving by air are not intending . . . [to immigrate] to the United States,' the official said. The Biden administration then continues `working in partnership' with other countries `to ensure that route is not diverted' through another country, she said.

such as, for example, by implementing stricter visa entry requirements for certain nationalities. Increasing the restrictiveness for regional access to migrants from an origin country by having transit countries implement stricter immigration policies should reduce the total number of migrant encounters at destinations. We summarize this regional migrant deterrence hypothesis as:

> **H1a Regional Deterrence**: externalized migration restrictions that restrict access to individuals from an origin country will reduce encounters at a destination country.

Owing to differences in enforcement and state capacity among downstream transit countries to implement more restrictive measures, the effectiveness of restrictions in some regions may exceed the effectiveness of restrictions in other regions. But, in the aggregate, if externalized restrictions work to deter irregular migrants, the effect of increased restrictions across all downstream transit regions leading to a destination country should reduce irregular migrant encounters at that destination. We summarize this aggregate migrant deterrence hypothesis as:

> **H1b Aggregate Deterrence**: the cumulative effect of more restrictive externalized migration policies across all downstream transit regions will reduce arrivals at a destination country.

These deterrence hypotheses implicitly assume that migrants will either choose not to leave their home country or, after observing these restrictions, will stop or return home. This view, however, minimizes the migrant agency; if people who have already made the calculation to leave home observe restrictions limiting their access to a region, they will update their plans to avoid any such restrictions. We anticipate that externalization policies efforts will therefore have more limited effectiveness at stopping or otherwise meaningfully reducing irregular immigration flows into destination countries.

When routes are restricted or otherwise closed off, such as when a transit country restricts access following US externalization efforts, migrants will instead consider other routes or entry mechanisms rather than forgo their intended migration altogether. In the context of restricted access into Mexico, for example, this leads migrants to shift from entering Mexico via air or sea and instead proceed overground, likely through Central America or via the Darien Gap. This suggests that externalized migration restrictions only achieve desired results when applied broadly across multiple downstream transit regions, something which is unlikely given geopolitical realities; a consideration that we revisit in Section 06. Given these anticipated rerouting behaviors among irregular migrants who have already decided to pursue costly migration, we propose the following Spatial Deflection hypothesis:

> **H2 – Spatial Deflection**: Externalization restrictions that limit migrant access to a transit region will spatially deflect migrants to nearby regions.

In the context of south-north migration in the western hemisphere, these rerouting behaviors suggest different responses to externalization restrictions based on a restricted region's geography relative to the United States. Table 01 summarizes hypothesized relationships between externalization restrictions imposed in four potential transit regions on the number of encounters across two destinations (the US southern border and Caribbean sector) and one transit corridor, the Darien Gap. Critically, in a world where migrants do not exercise routing agency the effect of any restrictive migration policy should always be negative.

[Table 01 – Effect directions]

Taking as an example restrictions imposed by Mexico, Table 1 summarizes our Spatial Deflection Hypothesis. We hypothesize that, should Mexico require visas for entry, these restrictions would lead to fewer encounters at the US southern border. Remember that this does not mean that migrants will give up their northern movement: restrictive visa policies imposed in Mexico should lead to more migrant encounters in the US Caribbean sector as migrants attempt to navigate around such restrictions to gain access to US via other routes. Therefore, while migration restrictions may lead to a decrease of encounters on one route, they are likely to lead to an increase in encounters on another route as migrants adjust to the changes and update their paths while transiting to their intended destinations.

The route adjustment process further suggests that restrictive externalization policies do not outright stop the flow of irregular migrants, but, in addition to spatial deflection, operate to delay and/or deflect their arrival by incentivizing rerouting to alternative migration pathways. Therefore, for each of these effects, we hypothesize that the policy effectiveness of restrictions will decay over time as migrants pursue new routes to circumvent new restrictions. The result of the policy is approximately the same equilibrium level of migration as before, but with migrants arriving through alternative pathways at their destination. This pattern of migrant rerouting over time in response to restrictive externalization policies leads to the following Temporal Deflection hypothesis:

> **H3 – Temporal Deflection**: Externalization restrictions will reduce irregular migrant encounters following the restriction, but the effectiveness will diminish over time as migrants reroute into other regions to navigate toward their intended destination.

Returning to the theorized responses to immigration restrictions implemented in the transit regions identified in Table 1, this temporal deflection process becomes particularly apparent for the route through the Darian Gap. As transit regions geographically north of the Darien restrict access to migrants, our Spatial Deflection hypothesis suggests that encounters in the Darian Gap will increase as migrants respond to restrictions by rerouting through the Darian. This rerouting process will take time as migrants respond to the upstream policy changes which, all else equal, will result in an initial decrease in migrant encounters, an effect that will dissipate over time. For example, if Mexico restricts visa access, migrants reroute through the Darian. This should lead to an immediate decrease in encounters at the US southern border. However, these migrants are still en route to the US, though through the Darien, and will arrive later than they would otherwise if migration restrictions not been implemented. This rerouting process results in a delay in irregular encounters as migrants work to reroute around immigration policy restrictions and suggests Temporal Deflection — that the hypothesized effects summarized in Table 1 will decay over time as encounters return to an equilibrium status quo following any externalized migration policy change.

This hypothesized relationship between migrant encounters and rerouting illustrated by this Darian Gap example and arrivals at the US southern border suggests an additional component in the relationship between externalized immigration restrictions and irregular migrant encounters at destinations: the viability of alternative routes. In the context of irregular migration in the Western Hemisphere, the Darian Gap represents a route of desperation that most migrants would seek to avoid: the region is largely undeveloped with difficult and dangerous terrain isolated from any nearby settlements as well as has a history of being utilized by non-state armed groups and criminal

organizations who migrants may encounter when routing through the region. Owing to these risks, the Darian Gap has not historically served as a viable migration route which aspiring migrants would consider.

Therefore, in addition to our hypotheses that externalization policies will have limited efficacy due to Temporal Deflection resulting from migrants changing plans in response to externalized immigration restrictions and rerouting to arrive at their intended destination through alternative points of entry, we also hypothesize that the overall effectiveness of these externalization policies will depend on the viability of migration routes upstreamfrom transit regions implementing migration restrictions. Returning to the Mexico example, the effectiveness of externalization efforts by the US to have the Mexican government implement more stringent immigration controls for migrants from targeted origin countries will vary depending on the popularity of the Darian as an alternative point-of-entry for migrants hoping to avoid new restrictions. Rather than risk being detained upon arrival at an airport or other point-of-entry with controlled security checkpoints, migrants could instead consider using the Darian Gap to travel into Mexico on foot or by vehicle where they could avoid passport checks. As more migrants recognize alternative viable routes, the initial effects of time since restrictions on encounters at destinations will be greatest – more migrants will initially reroute away from the restricted region. In such a circumstance, the effectiveness of destination country externalization efforts to limit migrant encounters would be modified by the viability of alternative migration routes. This leads to our final Route Viability hypothesis:

> **H4 – Route Viability**: The effectiveness of externalization policies over time to reduce the number of irregular migrant encounters at a destination will vary depending on the number of migrants employing alternative migration routes. As more migrants travel through alternative routes externalization restrictions will initially be most significant as migrants reroute. However, as time passes and migrants continue traveling toward their destination, the effect of the restriction on encounters will become insignificant or positive.

Taken together these four hypotheses: Migrant Deterrence, Spatial Deflection, Temporal Deflection, and Route Viability summarize our anticipated relationship between the effectiveness of externalized migration policy restrictions and global irregular migration flows. If externalization works, more restrictive policies in transit regions should reduce migrant encounters at destinations. However, irregular migration represents a costly (and often deadly) choice which most individuals and families would seek to avoid. The costs of remaining in their home country often exceed the perceived costs of migration even when transit regions implement restrictions. It is for these migrants, those who have already decided to bear the costs of irregular migration, that we most anticipate these hypothesized patterns of deflection and route viability will matter. In the following section we turn to describing new data sources as well as an empirical strategy that allows us to test these hypotheses.

04 – Data and Methods

Data

We explore the effectiveness of migration externalization policies to deter or limit irregular migration by fitting a series of panel exponential hurdle models of monthly irregular migrant encounters

through one transit region, the Darien Gap, and at two destinations, the US southern border and Caribbean sector. Our sample consists of monthly irregular migrant encounters in these three locations for 157 countries[2] over a four-year period at a monthly interval from December 2019 to December 2023. By irregular migrant encounter we specifically mean migrants crossing or attempting to cross through a transit country (e.g., Panama) or into a destination country (the United States) through a non-authorized point-of-entry and/or while lacking the proper legal documentation for migration.

Irregular Migration — We use two sources of irregular migration data to explore similarities and differences in the drivers of migration through the Darien Gap and into the US through its southern border or Caribbean sectors. Darien Gap crossing reports come from UNICEF's Office of Monitoring and Evaluation and report the total count of monthly encounters[3] by migrant country of origin.[4] Within our sample, migrants encountered in the Darian originate from 97 countries in the Americas, Europe, Asia, and Africa.

To measure migration demand in the United States, we use US southern border and Caribbean sector encounter data which come from the Department of Homeland Security's (DHS) Custom's and Border Protection (CBP) office which reports total monthly encounters, disaggregated by migrant country of origin reported by CBP agents across the border sector during [5] During our study period CBP agents encountered migrants originating from 131 countries attempting to cross into the US along its southern border and from 52 countries attempting to cross into the Caribbean sector.

Externalization restrictions — We measure migration externalization policies by employing dyadic visa accessibility reports. Data on visa restrictions come from the Passport Index Dataset, which records monthly changes in dyadic entry requirements for residents of all countries to all other potential destination countries (Passport 2023, Passport Git 2023). The data provide monthly snapshots of passport travel power beginning in 2019 through to the end of our analysis in December 2023. Additionally, they record requirements for entry of foreign nationals into a destination country, including whether visa-free access is allowed, the number of visa-free days a foreign national may

[2] As our focus is primarily on migrant sending countries we exclude OECD countries from our sample (with the exception of: Chile, Costa Rica, Colombia, and Mexico).

[3] During our study period, Panamanian border authorities did not detain and deport migrants encountered after crossing through the Darien. Therefore, as migrants had little incentive to evade border authorities, our measure of encounters at the northern side of the Darien jungle provides a reliable indicator of the total volume of migrants passing through the Darien Gap.

[4] Both our US and Darien encounter data report migrant country of origin, which is the migrant's birth country. Indeed, many migrants travel to their intended destinations over time and sometimes make their trip in stages. Ideally, the data would also report the country in which a migrant most recently resided, but to our knowledge, such data does not exist. However, migrant country of origin does provide a valid measure of demand for entry for migrants from similar geographic regions and backgrounds.

[5] Unlike our Darien measure, US encounters include both successful migrant apprehensions by US border personnel as well as encounters and unsuccessful apprehensions. Unlike Panamanian authorities during this period, US personnel would attempt apprehensions on contact, thereby incentivizing migrants to evade US personnel if possible, likely leading to undercounts of total crossings in a month. However, as we have no theoretical expectation that our primary variable of interest---externalization proxied by visa policy changes---influences the efficacy of US border personnel to encounter and detain migrants at the US border, any such undercounts should not induce bias on the estimated effect of visa policy changes on monthly migration flows.

legally reside within a destination country, or whether residents from a foreign country are banned from entry.

To facilitate comparisons of the various visa requirements across all countries, we operationalize visa entry requirements into four ordinal levels corresponding to restrictions placed on a migrant from an origin country into a destination country: travel ban or COVID ban (3), travel with preauthorization (2), streamlined travel (e.g., visas on arrival) (1), and visa-free travel (0). Higher values of our operationalization therefore correspond to more restricted travel access, while lower values correspond to easier travel accessibility. These values capture the difficulty of legal entry for migrants of a particular origin into destination countries.

Since our outcome of interest concerns migration routes through the Darien or into the US across its southern border or via the Caribbean, we aggregate these visa measures for each origin country reported in our data by averaging visa entry scores for each origin country-month in our panel across four transit regions: Mexico (Mex), Central America excluding Mexico (CA)[6], the Caribbean (CR), and South America (SA). Therefore, for each country in our panel, these regional averages reflect the restrictiveness of legal access a resident would have to countries in one transit region relative to others. This provides a means to investigate how immigration access restrictions deter (H1a, H1b) or spatially deflect (H2) migrants to other regions and routes in pursuit of their final destinations.

To evaluate whether migration restrictions create a delay in arrivals due to this rerouting through a process of Temporal Deflection (H3), we use our visa restrictiveness measures to construct an indicator of the time (months) since an origin country's access to a region became more restricted. These origin-country specific measures report the number of months since travel to a particular transit region (Mex, CA, CR or SA) became more restricted for residents of that origin country. This allows us to evaluate whether the effectiveness of migration restrictions decay over time as migrants form new strategies to evade those restrictions. Table 02 provides summary statistics for our main variables: encounters and externalized migration policies.

[Table 02 – Descriptive statistics main variables]

Control Variables — In addition to these regional passport travel values, we include several control variables to account for alternative explanations of variation in migrant flows through both the Darien and into the United States including armed conflict, natural disasters, extreme weather anomalies (wet bulb temperatures and extreme precipitation/drought), population dependency structure, policy changes related to COVID lockdown restrictions, as well as US economic conditions proxied by US unemployment. The Appendix provides more detailed discussion motivating the inclusion of these variables as well as their operationalization and descriptive statistics.

Methods

Our dependent variable is zero bound and highly skewed towards zero as most countries in the panel do not have citizens encountered at any of the three locations in our analysis. Among all the country-

[6] Movement through Mexico provides the most direct access to the United States while also having the greatest number of migrant arrivals. Therefore, we separate our arrival measure for Mexico from the rest of Central America to account for this. Our results are robust to a combined Central America indicator that includes Mexico.

months in our data 73.8% report no encounters at the Darian Gap, 67.6% report no encounters along the US southern border, and 93.2% report no encounters in the US Caribbean sector. Therefore there are two related processes at work: whether there are any migrants from country i in month t and, if so, the number of migrants. To account for this, we use exponential hurdle models (Cragg 1971; Wooldridge 2010) which leverage a selection equation to condition the count process.

Specifically, the model uses an observed boundary value (0 reported migrants in a country month) to fit the following functional form: $encounters_{it} = s_{it}h^*_{it}$; where $s_i$represents a latent selection variable indicating whether the outcome is bounded at 0:

$$s_{it} = \vdash^{1\ if\ z_{it}\gamma+\epsilon_{it}>0}_{0\ otherwise}$$

We model the selection process (z_{it}) using a vector of predictors that past research —discussed in section 2 — indicates influences initial migration decisions including: armed conflict, climate change (wet bulb temperatures and drought), acute natural disasters, and economic indicators (population dependency and US unemployment). We also include country-region (based on World Bank definitions) and post-Covid fixed effects in the selection equation to account for heterogeneity in which regions are more likely to have any migrants encountered at the three locations represented in our data. The selection equation is modeled using a probit regression.

The latent count process (h^*_{it}) is only observed when the selection variable equals 1 and we model this process using an exponential functional form:

$$h^*_{it} = \exp(x_{it}\beta + \upsilon_{it})$$

We model the count process (x_{it}) using the same predictors included in the selection equation with the addition of our externalization visa measures and substitute regional fixed effects with origin-country and month fixed effects. All reported models include one-month lags of dependent variables. In addition to testing our deterrence hypothesis, we also want to make inferences regarding differences between the externalization policy effects *across* the models. Therefore, we estimate model standard errors, (υ), with a simultaneous variance-covariance matrix with cross-equation error correlations. All models employ robust standard errors clustered on migrant origin-country.

Our four hypotheses suggest different functional forms in (x_{it}) as well as appropriate tests to evaluate the argument proposed in the theory section. Table 03 summarizes our four hypotheses, their suggested functional forms, and our theoretical expectations. Absent migrant deflection, if externalization restrictions work to deter migrants, we should observe negative values on our visa restriction parameters (H1a). If restrictions work in the aggregate, the sum of our visa restriction measures should be negative indicating fewer migrant encounters in response to more restrictive policies (H1b).

However, if restrictions deflect migrants and our spatial deflection hypothesis (H2) finds support we should observe more restrictive migration policies leading to *increased* encounters for some regions depending on the geography of the transit region relative to the destination as summarized in Table 01. As this suggests different responses to restrictions between destinations (models) we evaluate the spatial deflection hypothesis by testing whether visa model parameters align with our theoretical expectations summarized in Table 01. For example, if restrictions in Central America (CA) deflect migrants to the Darian we should observe a negative value on that parameter in the US southwest border equation and a positive value in the Darian equation indicating we can evaluate US SW → Darian deflection by testing whether the parameter on CA restrictions in the US SW model is less than CA restrictions in the Darian model. Table 04 summarizes our expectations for the relative value

of the visa parameters across our models. For some, we do not anticipate a statistically significant difference. For example, more restricted access to South America should limit encounters at both the US southern border as well as in the Darian gap leading that parameter to be negative in both models and statistically indistinguishable.

We evaluate the Temporal Deflection hypothesis (H3) using our months since visa restriction measure as well as its squared value. This quadratic specification allows us to properly test whether the effectiveness of restrictive externalization measures decreases over time as migrants reroute.

Finally, we evaluate the Route Viability hypothesis (H4) with an interaction between months since visa restriction and its squared value with one-month lagged Darian encounters. This interaction tests whether the over-time effectiveness of restricting migrant access to a transit region to reduce encounters at destination country varies as a function of the number of migrants transiting through an upstream route. As there is no significant irregular north → south migration in the western hemisphere, we only fit this model on US border arrivals.

[Table 03 – Theoretical overview]

05 – Results

Each of the three locations we analyze has experienced a significant increase in the number of monthly encounters in the post-Covid period. Using December 2021 as a baseline, by December 2023 year-on-year monthly encounters at the US southwest border had risen by 475% (36k to 183k), at the US Caribbean sector by 2343% (54 to 1.2k), and by 583% (4.2k to 24k) in the Darian Gap. These sharp increases in the number of migrants traveling to the US or routing through the Darian underscore both the difficulty of controlling migration flows as well as limitations that externalization policies have in reducing total migrant flows.

Consider first H1a – Regional Deterrence, Table 04 provides parameter estimates modeling the relationship between regional visa restrictions and encounters at the US southern border (1), the US Caribbean sector (2), and the Darian Gap (3). Overall, these models do not provide supporting evidence for H1 that visa restrictions deter irregular migrants and reduce encounters. Indeed, for several regions in these modes, more restrictive visa policies correspond to *more* net predicted irregular migrant encounters rather than fewer.

Considering encounters at the US southern border (1), in alignment with our theoretical expectations (Table 01), restricting South America, and Mexico lead to significantly fewer encounters; decreasing encounters by –970 [-1604, -338] and –285 [-567, -2.5] in response to a 1-unit increase in our passport restriction measures for South America and Mexico respectively. However, restrictions in the Caribbean (in alignment with expectations) as well as Central America (contrary to expectations) correspond to significantly more predicted encounters at the border. Increasing visa restrictions in Central America by 1-unit corresponds to 1122 [384, 1860] more encounters while an equivalent visa restriction in the Caribbean region corresponds to an increase of 1772 [96, 3449] irregular encounters at the US southern border. These patterns make sense if migrants respond to migration restrictions by navigating through less secure routes to avoid encounters with customs and border protection in both transit and destination countries.

[Table 04 – Results: Deterrence and Spatial]

Similar patterns that suggest spatial deflection – which we evaluate in more detail shortly – emerge from the US Caribbean and Darian models. For example, restricting access to South America leads to significantly fewer migrants traveling through the Darian gap which makes sense as migrants would first need access to South America before starting a journey from Colombia north through the Darian. However, restricting migrant access to Central America leads to significantly more migrant encounters in the Darian as rerouting behavior occurs and migrants seek out new routes to access their intended destination.

While the results presented in Table 04 do not provide consistent evidence in support of Regional Deterrence (H1a), the results for Aggregate Deterrence (H1b) are equally mixed. In the aggregate, more restrictive visa policies in transit regions downstream of the US southern border result in significantly more irregular migrant encounters. On average, our model predicts 308 [-203, 820] monthly arrivals from origin-countries that have visa-on-arrival access to each of the four transit regions. Restricting this access by 1-unit on our measure to an equivalent of visa pre-travel authorization increases the predicted number of US southern border arrivals to 3730 [-487, 7948].

This makes sense if migrants adjust to closed legal routes by instead navigating through more obscure routes to reach the border. In contrast, in the Caribbean, these results suggest that in the aggregate visa restrictions do appear to reduce overall encounters at that border sector. For an equivalent origin-country with visa-free access to the four transit regions our model predicts 81 [-183, 345] arrivals in the US Caribbean sector. Increasing restrictions by 1-unit to visa pre-travel authorization decreases predicted arrivals in the US Caribbean sector to 2 [-2, 6] providing evidence that externalization restrictions are more effective at controlling migration through the maritime Caribbean route relative to the overland US southern border route. In the aggregate, our model indicates that visa restrictions do not appear to deter encounters in the Darian Gap.

As the results in Table 04 suggest, there does appear evidence in support of our Spatial Deflection (H2) hypothesis. Comparing the irregular migrant encounter responses to regional visa restrictions across our three models reveals significant differences in how visa restrictions affect encounters supporting our hypothesis of spatial deflection. Table 05 provides results testing for differences in the distributions of our regional visa parameters between the US southern border sector and the US Caribbean sector as well as between the US southern border sector and the Darian Gap.

[Table 05 – Results SUR]

For the US southern border, these results indicate significant difference in migrant responses to visa restrictions in the Caribbean, Central America, and South America relative to migrant response to equivalent changes on encounters in the US Caribbean sector. These results, along with parameter estimates from Table 04 indicate migrant spatial deflection supporting H2. Consider restricting migrant access to Central America, the significant difference in the response to Central American restrictions visa restrictions between the US southwest and US Caribbean models (test statistic = 5.75, p-value = 0.017) indicate that the divergent encounter response reported in in Table 04 for Caribbean restrictions in these two sectors represent a statistically significant difference in how migrants respond to visa restrictions. Whereas Central American visa restrictions reduce overall encounters in the US Caribbean sector ($\beta_{CA}^{US\ CR} = -2.449$), these same restrictions increase encounters at the US southern border ($\beta_{CA}^{US\ SW} = 1.707$), possibly due to more migrants routing

downstream through the Darian gap. Indeed, based on results in Table 05, the difference in irregular migrant responses to Central American visa restrictions between US southern border encounters and Darian encounters is statistically significant (test statistic = 2.77, p-value = 0.09) indicating that the parameter estimates for Central American visa restrictions from the US southwest and Darian models in Table 04 are significantly different providing evidence suggesting that migrants may respond to restricted Central American access by first routing through the Darian Gap while navigating northbound to the US southern border.

These routing responses suggested in the previous analysis in support of our Spatial Deflection Hypothesis would take time to occur as migrants would need to recognize the implementation of the restrictive policy measures, change plans, and ultimately route to a new entry-point to start their migration. We turn to evaluating this possibility and evidence in support of our Temporal Deflection Hypothesis (H3) in Table 06 which summarizes the parameter estimates of visa policy restrictions from our quadratic regression specifications fit on aggregate US encounters (southwest border and Caribbean) and Darian encounters 1, 6, and 12 months after migrant access to a region restricts.[7] As these results indicate, the effect of visa restrictions exhibit nonlinearity with effectiveness of restrictions on migrant encounters shifting over time.

[Table 06 – Temporal]

While these results do provide some evidence of an initial encounter decrease at the US border 1-month after restrictions in Central America, the effect is short lived and becomes statistically insignificant 2-months after the restriction. These results provide stronger evidence in support of our Temporal Deflection Hypothesis for migrant responses to restrictions imposed in South America both for encounters at the US border, but also at the Darian Gap. Encounters at the US border appear to decrease the most approximately 6-months after a downstream transit region restricts, after which the effect begins to increase before becoming statistically insignificant. In contrast, in the Darian Gap these results indicate that migrant encounters monotonically decrease in time following a visa restriction in South America. Figure 02 illustrates these results over a full 1-year window following a visa policy restriction in both Central and South America for encounters at the US and Darian Gap.

[Figure 02 – Duration (conditional effects)]

To better illustrate these effects, consider the case of Cuban migrants attempting to enter the United States. Figure 03 provides predictions for the estimated number of Cuban encounters at both the US border and in the Darian Gap from 1- to 12-months following visa policy restrictions in Central and South America. In the month immediately following the restriction Cuban arrivals at US borders significantly decrease by approximately 708 [-1183, -233] arrivals in a month. However, as time passes (and migrants have had time to adjust) this effect diminishes and by six months the model suggests 281 [-431, -132] fewer migrants and by 9 months a statistically insignificant change in the number of migrants. This 9-month adjustment process likely reflects migrants finding new routes into the US, something we evaluate qualitatively in the case study section.

[Figure 03 – Duration, Cuba (predicted values)]

[7] Full model results with parameter point estimates, controls, and selection equation results are available in the appendix.

In contrast, in the Cuban encounters in Darian Gap exhibit an empirically distinct pattern relative to the US border that is consistent with our theoretical expectations. Restricting access to Cuban migrants has no statistically significant effect on reducing encounters in the Darian for approximately 6-months during which time those already present and in transit are likely making their way through the Darian. However, as the effect of restricted access to South America persists, by 6-months the effect becomes statistically significant and indicate that approximately 14 [-25, -4] fewer Cubans will travel through the Gap and by 12-months this effect stabilizes at a new equilibrium of approximately 27 [-46, -8] fewer Cuban encounters in the Darian. This makes sense, as a South American route closes to Cubans, fewer Cuban-nationals will attempt to cross through that route and instead opt for Central American access to navigate north to the US border (as the US results show, after 12 months South American restrictions become statistically insignificant).[8]

Given the strong evidence from the previous analysis on Spatial and Temporal Deflection that the Darian Gap has on migrant routing behaviors as they navigate towards the United States, what role does the scale of migration through this region have on the over time effectiveness of encounter restrictions to limit arrivals at the US border? Our Route Viability Hypothesis (H4) suggests that Darian encounters should amplify the effectiveness of Central American restrictions over time leading to more pronounced decreases in US encounters earlier as the effect of the visa policy shift will be to deflect migrants already on route. However, consistent with our previous analysis we would anticipate this effect to diminish over time and, as migrants find new paths toward their intended destination, possibly reverse becoming positive.

Table 07 summarizes the interaction effect between our visa duration quadratic terms and lagged Darian encounters on US border encounters holding Darian encounters at three representative levels – the 20th, 50th, and 90th percentiles – based on reported encounter figures in our data corresponding to approximately 3, 12, and 315 monthly encounters for an origin-country.

[Table 07 – Temporal interactive]

Consistent with our expectations, the effect of implementing visa restrictions in Central America matters more as more migrants transit through the Darian Gap. Implementing such restrictions places a barrier that restricts these in-transit migrants leading to statistically significant short-run reductions in encounters during the first 6-months following a restriction. The migrant encounter reduction effect to this policy shift is most pronounced when enacted for migrants originating from countries at the 90th percentile of reported Darian encounters. However, regardless of volume of migrants crossing through the Darian as time passes the effect of the restriction to reduce migrant encounters at the US border diminishes to zero becoming statistically insignificant and, after approximately 15-months, becomes positive and statistically significant, again illustrating migrant rerouting potential in response to restrictive migration policy shifts. Figure 04 illustrates how the volume of migrants crossing through the Darian Gap amplifies the effectiveness of visa policy restrictions over time leading to larger initial decreases of US border irregular migrant encounters for migrants from countries with a higher number of individuals migrating through the Darian.

[Figure 04 – Route viability (conditional effects)]

[8] Equivalent estimates for other relevant migrant origin-countries including Venezuela, Senegal, and China appear in the Appendix.

These results provide strong evidence for our Spatial and Temporal Deflection hypotheses as well as our Route Viability Hypothesis – migrants, as evidenced by total monthly encounters, exhibit a high degree of responsiveness to shifting policy landscapes that limit or outright restrict their access to transit regions. In contrast, evidence in support of externalization effectiveness to deter migrants is mixed at best. While some evidence does emerge that externalization restrictions reduce migrant arrivals in some areas (e.g., the US Caribbean sector), in the aggregate we find little evidence to suggest that restrictive visa policy shifts lead to meaningful reductions in monthly irregular migrant encounters. Rather, our analysis has demonstrated that, when one region closes its doors to migrants, they reroute and find access to their intended destination through other transit regions. This process takes time leading to short-run decreases in the number of migrants encountered following a restriction – possibly leading some to prematurely label the policy restrictions an outright success. But our results provide a more nuanced view – these initial encounter reductions evaporate as months pass by and migrants find new routes to better reach their destination following restrictive visa policy changes.

Several other interesting findings emerge from our empirical work related to our control variables and selection equations that explore the role of climate, conflict, and economics to drive initial migration decisions. In the interest of space, we explore these relationships in greater detail in the Appendix. Having established an empirical baseline demonstrating migrant deflection behaviors in response to visa policy restrictions, we now turn to analyzing the relationship between US externalization efforts and irregular migration originating from several relevant migrant origin countries in the Western Hemisphere.

06 – Illustrative Vignettes

The quantitative results demonstrate how migration flows vary in response to visa policy changes. However, what evidence exists to illustrate where and why governments externalize migration policy, and how do changes in visa policy play into the externalization framework? Do states ever loosen their visa policies to migrant-sending states as a retaliatory foreign policy tool against other destination states? In this section we address these questions and demonstrate migration policy externalization at work in response to US efforts vis-a-vis its neighbors in downstream transit regions.[9]

In recent years, partner states throughout the Americas have often, at the behest of the United States, introduced obstacles to migration in the form of visa policy restrictions. Migrants originating from countries such as Haiti, Nicaragua, and Cuba have all faced increased visa restrictions erected which limit flights and easy migration routes (see Amaral, 2023). These changes have had a notable impact on migration routes and shifted how migrants navigate the Americas to the US southern border. As two notable examples, the US has worked to have both Mexico and Nicaragua to implement stronger visa restrictions on migrants from a host of origin-countries encountered at the US southern border. However, while Mexico has assisted in the implementation of visa restrictions to halt (or redirect) migration, Nicaragua has taken an antagonist approach; instead rejecting visa restrictions and providing a gateway to Central America.

[9] In the supplemental appendix we provide a more detailed analysis of migrant routing behaviors in response to externalization restrictions.

Mexico

Owing to its close geographic proximity to the US, power asymmetry, and (inter)dependent economic relationship, Mexico has long acquiesced to US border externalization policy requests. Both countries collaborate on border security issues, but this collaboration has taken a new form under the Biden administration through the coordinated use of visa restrictions to halt migration. During the current period that we analyze in this study (2019-2023), the implementation of visa restrictions against Venezuelan nationals represents the preeminent example of this coordination.

While no clear "smoking gun" exists that explains the policy shift by Mexico, the Biden administration has adopted a greater balance of carrot and stick relative to its predecessor's more aggressive efforts to coerce migration policies using threats of tariffs. Despite initial antagonisms from Mexican president Andrés Manuel López Obrador to Joe Biden when the latter entered office—some viewed the Mexican president as more favorable to the similarly-styled strong man persona of Donald Trump—López Obrador and Biden have shared a relatively positive and collaborative relationship, as highlighted by the return of the High-Level Economic Dialogue (HLED) mechanism and the new U.S.-Mexico Bicentennial Framework for Security, Public Health, and Safe Communities (Wood and Helfgott, 2022; Sheridan and Sieff, 2023). The Biden administration has also supported Mexico's endeavors to address the root causes of migration in southern Mexico and Northern Central America through the *Sembrando Oportunidades* initiative and collaboration with Mexico's development agency, AMEXCID (Wood and Helfgott, 2022). Furthermore, Biden has avoided starkly criticizing or attacking López Obrador over militarization or dismantling of institutions, which some allege is directly related to migration-related cooperation. (Taladrid, 2024; Sheridan and Sieff, 2023; Dresser, 2024)

As a result of this engaged, non-punitive diplomacy and robust cooperation, the Biden administration has extended influence over Mexico's migration policy. The implementation of visa restrictions for Venezuela in January 2022 is emblematic of this, although the impacts—as empirically demonstrated in the results section—may not have proven as effective as desired.

Nicaragua

In comparison to Mexico and other states in the hemisphere, Nicaragua has rejected US border externalization overtures, employing a strategy of what some analysts frame as "weaponizing migration" as a foreign policy tool (Orozco, 2024a). The Central American country has rejected calls by the United States to stymie irregular migration and implement visa restrictions against various nationalities that frequently record encounters at the US-Mexico border. Instead, Nicaragua has facilitated the migration of a growing number of migrants from various nationalities across the globe, including even eliminating visa restrictions for Cuba and Haiti.

In comparison with the carrot-heavy approach with Mexico, the Biden administration has looked to use the stick with Nicaragua to coerce cooperation on border externalization. In November 2023, the Biden administration introduced a new sanctions policy geared specifically towards "targeting individuals running charter flights into Nicaragua designed primarily for irregular migrants" heading to the US border (US Department of State, 2024a). But even beyond migration, the US sanctions regime against Nicaragua dates to 2018, when the Trump administration responded to political repression against protestors of Daniel Ortega's government (White House, 2018).

In response to these sanctions and antagonistic relationship, Nicaragua responded by effectively flexing the one muscle it has that can hurt the United States – facilitating migration. Nicaragua also profits handsomely from increasing access to the Americas and the United States. Between January and October 2023, the country generated an estimated $66 million in net taxes levied on migrants using the country as a transit region on their larger migration journey (Amerise, 2024; Confidencial, 2024). Members of the Nicaraguan armed forces and law enforcement also unofficially tax and solicit bribes from migrants, helping the Ortega government retain their loyalty and contentedness.

The US responded Nicaragua's loosening of visa restrictions with further sanctions as a coercive measure, but to no avail. These sanctions target airlines, travel companies, and other individuals responsible for coordinating charter flights landing in Nicaragua with migrants in tow (see, for example, US Department of State, 2024b; US Department of the Treasury, 2024; and US Department of State, 2024c). However, these efforts have failed to stop Nicaragua's role as a country of entry for transit migration: the Inter-American Dialogue identified, for example, 1,145 charter flights of at least 150 passengers to Managua from Port–au-Prince, Havana, Curaçao, Caracas, Casablanca, and Zanderij; all en route to the Mexico-US border between July 2023 and January 2024 (Orozco, 2024b; see also Orozco, 2024c).

Although most countries in the hemisphere are far more amenable to US border externalization than Nicaragua, negotiations and calls for expanding visa restrictions have taken time with many partner countries in the region. Ecuador, for example, received a rapid surge in arrivals of Chinese migrants starting in 2023, many of them fleeing political repression and a slowing economy at home (Guerra, 2024). Only in June 2024, however, did Ecuador finally move to suspend its mutual visa waiver with China, likely stalled over the last year as the Andean country developed and ultimately signed a free trade agreement (FTA) with China in May 2023, which officially became effective on May 1, 2024. Once the FTA came into force, Ecuador became at greater liberty to acquiesce to US pressure, particularly as US aid has surged in 2024 to address security concerns, and as Ecuador has lobbied for an Ecuador-US FTA of their own and Temporary Protected Status for Ecuadorian nationals in an irregular migratory status in the US (US Department of State, 2024d; Primicias, 2024).

In Central America, meanwhile, beyond the topic of visa restrictions, Panama and Costa Rica have proven willing partners for a border externalization that includes US-funded deportation flights of migrants emerging from the Darien Gap. Panama has signed onto a deal, while Costa Rica is currently mulling over the proposition and potential details, as of July 2024 (EFE, 2024; Coriat, 2024).

Visa restrictions are not the be-all and end-all of border externalization, but they have proven a key element of the US migration management toolbox under the Biden administration amid the post-COVID shift in migration trends. However, as our empirical results demonstrate, the proliferation of their use has not correlated with efficacy in halting migration—desperate migrants pushed by violence and food insecurity have instead found new routes to make their way to US soil.

07 – Conclusion

Migration policy externalization occurs when governments attempt to restrict migration across their borders by encouraging or coercing neighbor states to restrict migration flow. In this paper we investigate the effectiveness of these externalization efforts by examining one popular tool in the externalization arsenal: visa policy restrictions. Migrant-receiving states encourage their neighbors

to tighten visa restrictions for countries with large migrant outflows. But do these policies work? Our empirical results and qualitative analysis suggest they do not. Rather, migrants who are determined to reach a destination reroute to avoid transit regions with strict visa entry requirements.

We demonstrate this empirically by analyzing irregular migration through the Darien Gap and into the United States through its southern and Caribbean border sectors. Our analysis offers little support to suggest these externalization policy efforts translate into meaningful long-term reductions in irregular migration encounters. Rather, migrants observe externalized immigration restrictions imposed in transit regions and respond by deflecting into other nearby regions where they can then continue onward toward their preferred destination.

This process of migrant rerouting process takes time which can lead policymakers to incorrectly declare these policies a success when the observe initial migrant encounter decreases following the implementation of restrictions. But our results demonstrate that this confidence is misplaced – over time migrant flows return to previous levels or even significantly positive as migrants find new routes to their destinations. The volume of migrants traveling through routes downstream of restrictions can amplify this pattern leading to larger initial reductions in encounters shortly following the restrictions. But, again, these early reductions wane over time and our models suggest that after approximately 9- to 15-months migrant flows following visa restrictions become significantly positive as migrants respond to restrictions by rerouting and finding new ways to reach their destinations.

Our results suggest several interesting avenues for future research including: the use of visa policy as a soft-power foreign policy tool, the relationship between climate change and irregular migration, and the generalizability of our findings to other regions---notably Europe and migration across the Mediterranean or through Turkey and into Greece. Nicaragua's lifting of visa restrictions on Cuban nationals raises interesting questions concerning why states might employ visa policy as a tool for migration diplomacy and to engage with neighbors or rivals. Under what conditions will a state open its doors to transit migrants in an effort to punish a neighbor? One challenge will be to distinguish when a state implements visa policy changes for domestic political reasons and when it does so in response to external pressure. In the Nicaragua case the motivation is clear, but to our knowledge, no systematic data set exists that tracks the political conditions under which a state updates their visa policy restrictions. With migration flows expected to increase moving forward into the mid-21st century, it is possible states may weaponize the movement of large populations as another competitive tool in international relations.

Climate change will certainly contribute to large-scale migration flows in the coming decades. Curiously, however, our empirical results provided mixed evidence on the relationship between climate change and irregular migration. More extreme temperature and precipitation anomalies predicted lower probability of arrivals at the US southern border and higher probability of arrivals at the Caribbean sector while they had no significant effect on arrivals in the Darian. This may indicate unique vulnerabilities for migrants prone to transiting through the Caribbean sector. However, it likely suggests a more complicated relationship between climate and migration than the simple hypothesis that increased climate variability leads to increased migration. Considering climate tipping points due to mounting climate pressures might better identify regions most likely to produce migrants forced to abandon their homes in response to climate change. Additionally, our analysis leverages a country-month unit of analysis. Ecological issues associated with aggregating local climate conditions to a broad country level could also mask the true patterns in the data. In that case,

one solution could involve a meso-scale analysis of subnational migration dynamics in response to changing climate conditions.

While our analysis focuses on migration through the Western Hemisphere, several major migration corridors exist globally (IOM 2022). For example, in the Appendix we offer a detailed analysis of Spain's externalization efforts with Morocco to curtail the flow of sub-Saharan migrants and show similar routing processes at work in an alternative setting like what we found for the Darien and the United States. Future work could extend our findings into these other regions to identify if the migrant routing behavior we identified is generalizable. Additionally, research could investigate how migrants from other regions respond to policy restrictions and identify the factors that influence the emergence of different adaptation strategies. For example, although the route is quite dangerous, much of the Central American migration corridor crosses through more temperate climates. Along several migration routes globally, migration corridors run adjacent to natural barriers such as mountain ranges, extensive deserts, or oceans. Along those routes, the efficacy of visa policy changes might matter more (or less) depending on how migrants navigate visa policy changes in contexts with different migration environments.

Our findings raise serious questions concerning the efficacy of migration policy externalization in general and visa policy restrictions specifically. Given the adaptive capacity of migrants to reroute in response to visa restrictions, these policies appear, at best, to delay arrivals and, at worst, to have no effect on net migration, while only serving to endanger migrants who take more dangerous and deadly routes to their ultimate destinations. Absent draconian regional policy coordination, which implements indiscriminate visa travel bans against migrants from specific countries, these policies do not appear to offer the most effective path forward to respond to migration. Rather, addressing poverty and violence in South and Central America countries through development and humanitarian aid likely has greater potential to alleviate migration pressure. Policy efforts of that nature could spare future migrants from undertaking dangerous travel in the first place.

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APPENDIX

Data

Control Variables

Since violence related to civil war, sectarian conflict, or cartel violence serves as a powerful driver for migration flows, we include a population-normalized measure of conflict fatalities in a migrant's origin country from the ACLED Armed Conflict Database (Raleigh 2010 ACLED).

Similar to armed conflict, natural disasters or extreme weather events may also help to account for migration flows as shock events because disasters can incentivize relocation and severe weather can undermine adaptive capacity within a region, leading to variation in migrant flows. The EM-DAT international disasters database provides estimates of the total fatalities attributable to man-made (e.g., industrial disasters), weather (e.g., flood or extreme storms), or other natural (e.g., earthquakes or landslides) disasters (EM-DAT 2023). We classify high-fatality disasters as a binary measure for any country that experienced an above-average number of disaster-related fatalities relative to all countries experiencing a disaster during a particular year-month in our panel.

While this disaster measure may capture migration potential due to acute weather-related disaster events such as fatalities attributable to intense storms, more gradual climate variation can also influence migration. Therefore, we also include two extreme weather indicators to account for temperature extremes as well as precipitation anomalies that cause extreme drought (wet) conditions in locations with typically wetter (drier) climates.

The first of our two climate measures reports wet bulb temperatures in migrant origin countries. Wet bulb temperature reflects a critical point when air temperatures and relative humidity jointly exceed a value at which humans can effectively cool their body's through sweat and evaporative cooling potential. At high temperatures with high air humidity, perspiration no longer can cool a body to below ambient temperatures leading to significantly higher probability of heat stroke when exposed to these conditions for long periods of time. Using remote sensing telemetry data from Copernicus Climate Change Service we compute measures of average monthly temperature and precipitation used to estimate average daily wet-bulb temperatures in a country-month. Since evidence increasingly suggests migration in response to climate change, we mean deviate this measure from its 40-year moving average. The 40-year mean deviated value allows us to better capture extreme temperature conditions that significantly deviate from the long-run trend relative to what a particular county typically experiences rather than one-off weather events like a hotter than average summer month.

To construct our precipitation anomaly measure, we employ the TerraClimate Palmer Drought Severity Index (PDSI), which reports variation in drought (wet) conditions relative to a region's typical climate (Abatzoglou 2018). PDSI values exceeding 5 correspond to situations of extreme precipitation, while values less than --5 correspond to situations of extreme drought (0 reflects normal conditions). Similar to the wet bulb measure, we use a 40-year mean deviated value of this series to capture drought(wet) conditions in a country relative to the long-run trend in a attempt to

better capture deviations due to climate change rather than one-off seasonal weather variability such as might be attributable to El Nino or La Nina.

We also include a measure of the population dependency structure in a migrant's country of origin as an indicator of the US monthly unemployment rate to capture economic incentives for migration. Data from the US Census Bureau's International Database (Census 2023) provide estimates of population dependency ratios that reflect the total non-labor force population (children under 15 and elderly over 64) relative to those typically in the labor force (individuals aged 15--64). This value reflects economic opportunities for migrants remaining in their home countries but also serves as a coarse measure for variation in family structures, which could account for variation in migration patterns due to some countries having larger elderly populations that preclude younger individuals from pursuing migration. Monthly US unemployment rate data report seasonally adjusted unemployed as a percent of the US labor force and proxy economic pull factors that may incentivize migrants to travel to the US (FRED 2024).

Finally, to account for changes in migration flows due to COVID-related policies, we include a post-COVID binary indicator that codes as 1 any month after November 2020 and 0 for months January 2020 to October 2020. In November 2020, travel restrictions implemented at the beginning of the pandemic, including those coordinated among the United States, Canada, and Mexico, began to ease (DHS 2020).

[Table A01 — Descriptive statistics control variables]

Results

The remaining variables in our models behave consistent with theoretical expectations. US monthly unemployment is always highly statistically significant and negative indicating that destination economic opportunity serves as a powerful predictor of irregular migrant arrivals. In terms of the other control variables, violence does not appear to robustly predict the overall number of arrivals at the US, but does strongly predict which countries have citizens reported in our encounter data as our measure of violence and its square term are always significant in our selection equations. The nonlinear relationship between violence and selection suggest that increased incidence of violence in countries with low or no previously reported violence significantly increases the probability that country is censored or, stated differently, significantly decreases the probability that migrants from an origin country appear in the encounter count process. However, as violence in an origin country escalates the probability of censoring decreases and the likelihood of any migrant encounters becomes positive and significant. This result is consistent with past research on the relationship between violence and refugee flight. Fleeing one's home is a costly exercise, so limited violence is unlikely to drive large numbers of migrant flow. However, as violence escalates, the probability of encountering migrants from the country experiencing conflict significantly increases.

Our post-Covid indicator also aligns with our expectations as well and indicates significantly higher migrant encounters in the post-covid period for the US southern border and Darian Gap. The post-covid dummy in the selection equation indicates that origin countries are less likely to be censored (i.e., to have reported encounters) in the post-covid period for the US southern border and Darian gap and are more likely to be censored (i.e., to not have reported encounters) for the US Caribbean sector. This finding aligns with our descriptive look at the encounter data — in the post-covid period

migrants are arriving at both the US southern border and in the Darian Gap from a more diverse collection of countries relative to the pre- and Covid-periods. The Caribbean route appears less favorable in the post-covid period; a result consistent with the lower popularity of that route as an entry-point into the US relative to the southwest border sector.

Extended Vignettes

Like recent efforts by the United States to compel Mexico to implement externalization policies, equivalent actions have taken place over the last few decades between 1994 and 2018, with US pressure eventually leading Mexico to adopt stronger, and ultimately more repressive, migration control policies in response to increased migrant arrivals heading to the US southern border. Since the late 1990s, both countries collaborated on policies to curb migrant flows into the United States for the stated purpose of countering human trafficking, drug trafficking, and violence. In 2008, President Bush, in partnership with Mexico's President Calderon, allocated $2.8 million USD to immigration enforcement at the US-Mexico border (Lara 2022). With this funding, Mexico pursued the securitization of borders, highways, air, and maritime routes; constructed migrant detention facilities; and increased border patrol training.

In 2019, in response to increasing migrant arrivals at the US-Mexico border, President Trump continued these externalization efforts and increased import tariffs on Mexican products, justifying the move by declaring that "Mexico was not doing enough to control migration" (BBC 2019). Trump tweeted that the tariff would gradually increase until Mexican authorities took steps to remedy the illegal immigration problem (NYT 2019). Both historical and more recent collaboration between the United States and Mexico in tackling irregular migration has advanced due to external pressure from the US government on its Mexican counterparts. The result of these policy interventions on the migrants themselves has created humanitarian consequences, with many migrants diverting to unsafe routes before arriving at the US southern border and ultimately seeking asylum.

Cuba

Immigration policies have historically strained relations between the United States and Cuba, especially since the culmination of the Cuban Revolution in 1959, after which 1.4 million Cubans fled to the United States. Although relations between these countries improved somewhat under the Obama administration, many immigration restrictions have since been renewed. The mass migration of Cubans to the United States has not ceased, with more than 2.7 million migrants traveling from Cuba over the last six decades.
While many attempt entry through the US Miami border sector, Cubans remain one of the top migrant nationalities arriving at the US southern border, particularly since the Cuban Adjustment Act was implemented in 1966. Many of these migrants initially fled political repression, but more recent waves have cited deteriorating economic conditions and humanitarian crisis as their primary motivation for fleeing (WOLA 2022). Beginning in 2017, two factors dramatically changed the migration calculus for Cuban nationals considering migration to the United States: the Obama administration's repeal of the "wet-foot/dry-foot" policy and new trade restrictions implemented by the Trump administration, which further contributed to contraction of the Cuban economy.

Just before leaving office in 2017, the Obama administration repealed a decades-long policy codified with the Cuban Adjustment Act of 1966, known as wet foot, dry foot, which granted permanent

resident (green card) status to Cuban nationals who arrived on US soil. Following this policy change, Department of Homeland Security personnel would now treat Cuban nationals identical to foreign nationals for all other countries, allowing for “expedited removal proceedings" (DHS 2017) and deportation for apprehended individuals detained within the United States or while attempting to cross the border. Functionally, this change indicated to aspiring Cuban migrants that setting foot on US soil in Florida (dry-foot) would no longer suffice for entry into the United States and would instead lead to deportation. Therefore, rather than reducing overall migration flows, this change likely contributed to an increase in Cubans opting for migration through the US southern border sector to increase their odds of successfully immigrating into the United States.

Economic conditions worsened in 2017 when the Trump administration implemented a series of new trade restrictions prohibiting all commerce with businesses controlled by, or operating on the behalf of, the Cuban military, intelligence agencies, and security services (CRF 2022). While the administration’s policies may have exacerbated Cuba’s economic situation, food and resource shortages, medical resource scarcity, and limited electric capacity has also left thousands of Cubans in devastating circumstances. The Biden administration has maintained the embargo, limiting supply shipments that have contributed to worsening economic conditions. These economic and resource limitations, coupled with political repression by Miguel Díaz-Canel’s regime, has led to an unprecedented flow of Cuban nationals migrating toward the United States for relief.

Indeed, this surge in Cubans arriving at the US southern border is apparent in the data used in our empirical analysis. Between January and September 2022, approximately 195,000 Cuban encounters occurred at the US southern border, compared to only 29,000 during the first nine months the year prior, representing a 570 percent year-on-year increase.

Coinciding with this surge in Cuban migrants arriving at the US southern border, in November 2021, the Biden administration noted irregularities and qualified as “illegitimate" the Nicaraguan general election earlier that month in which Daniel Ortega won his fourth presidential victory. In retaliation, Ortega lifted all restrictions for Cubans entering Nicaragua, thereby providing Cuban citizens with a visa-free travel destination in Central America (Reuters 2021). This ease of visa entry certainly factored into the decision-making for many Cubans who subsequently navigated the dangerous northbound route to the US southern border in the months following. The move also underscores the use of visa policy as a tool for migration diplomacy, where states might either incentivize neighbors to implement favorable visa policy as a tool to curb immigration at their own borders or, as in the case of Ortega and Nicaragua, use it as a soft power club to respond to unfavorable foreign actions. Regardless of how states incentivize or weaponize immigration policy, migrants bear the cost, as did Cubans traveling a dangerous route to the US southern border in 2022.

US policymakers attempted to find ways to curb the flow of Cuban arrivals in 2022. For example, at the start of COVID lockdowns, the United States implemented Title 42, an expulsion policy authorizing border patrol agents to expel migrants to their home country or to the country they most recently visited. Initially, Title 42 provided an exception to Cuban nationals. However, in response to the significant increase in Cubans encountered at the US southern border, beginning in January 2023, Title 42 was modified to allow the expulsion of Cubans back to Mexico.

Based on CBP encounter data that extends through January 2023, between December 2022 and January 2023---when the Title 42 policy change went into effect---Cuban encounters at the US southern border significantly decreased from nearly 8,000 to approximately 6,500 (WOLA 2023),

representing a 19 percent decrease from the previous month. While these numbers may suggest that the policy change limited inbound Cuban migrant flows, instead, and consistent with our empirical results and argument, Cuban migrants simply rerouted as one corridor closed off to them.

As revised Title 42 restrictions came into effect for Cubans traveling through Mexico to the US southern border, Cubans migrants responded by shifting their routes to more dangerous maritime options in the Caribbean. Following the policy change, CBP Miami sector encounters with Cubans increased from approximately 191 migrants in December 2022 to nearly 4,900 in January 2023, representing a 2500 percent encounter increase for that sector (WOLA 2023).

The Cuban case demonstrates several important implications of our argument on the externalization of migration policy, including efficacy limitations due to migrant routing and the use of visa policy as either a tool or weapon in state foreign policy making. In the Cuban case, it is the choices and preferences of Cuban migrants that are most significant for the overall flow of irregular migration. However, they also have the most to lose when faced with rapidly changing visa policy restrictions. Nicaragua's sudden decision to welcome Cubans, followed quickly by the United States tightening its borders through the Title 42 change, left many in a precarious humanitarian situation along the US southern border in Mexico, where cartels operate with near impunity.9 Furthermore, as our examination of initial migrant flow data suggests, these policy changes likely will not have the desired effect of limiting the flow of Cubans into the United States, as migrants simply reroute from Mexico to the Caribbean in the hopes of entering the United States by sea---a far deadlier route.

Venezuela

Between 2015 and 2022, more than seven million Venezuelans---nearly a quarter of the country's population---fled their homes due to economic collapse,10 an increasingly hostile and dysfunctional political system, and rising levels of violence (Castellanos-Canales 2023, HRW 2017). By mid-2017, mass detainment of antigovernment protesters led to widespread and documented instances of torture and abuse (HRW 2017), motivating many to flee the country and make bids for asylum elsewhere. Owing to their geographic proximity, Columbia, Ecuador, and Peru stepped up to accept the greatest number of Venezuelan asylees, but other states including Brazil, Mexico, and the United States also accepted increasing numbers of Venezuelans as the exodus unfolded. For example, Mexico welcomed significant numbers of Venezuelans and implemented a policy of accepting nearly all Venezuelan asylum applications (Freier 2018).

Owing to domestic turmoil and political oppression, the Venezuelan population grew into the largest diaspora in the Western Hemisphere, with many opting for a migration route that carried them out of Venezuela across the Simon Bolivar International bridge into neighboring Colombia before traveling north across Central America and arriving in large waves at the US southern border. The Simon Bolivar International bridge crosses the Tachire River, which runs through the Andes Mountains along the Venezuelan-Colombian border, creating a natural barrier between the two countries. The bridge historically served as a major migration route out of Venezuela (Watson 2018). However, Venezuelan authorities closed the corridor in 2019, claiming at the time that humanitarian actors were complicit in attempts to destabilize the Maduro regime. They reopened the bridge for pedestrian traffic in 2021 (Reuters 2021).

In recent years, but particularly since 2021, CBP authorities along the US southern border have recorded unprecedented numbers of Venezuelan arrivals. Based on our data, in 2018 fewer than 100 Venezuelans attempted to cross the US southern border, but by 2021, that figure had grown to over 104,000. The arrival rate increased the following year, and by September 2022, when our analysis ends, the number of reported Venezuelan encounters already exceeded the previous year's total, at 128,000. Given the scale of arrivals, US policymakers have pursued various strategies to reduce Venezuelan migrant flows. For example, the Trump administration imposed income requirements to prevent strain on the US healthcare system (KFF 2019), while the Biden administration has significantly expanded efforts to deport Venezuelans who illegally crossed into the United States (Reuters 2023). While these policies represent domestic attempts to address Venezuelan migration, both presidents have also used migration policy externalization as an additional tool to address the crisis by encouraging neighbor countries in Central America to intercept and detain Venezuelans or to deny their entry outright.

Mexico---which, as previously noted, had extended a flexible entry program to Venezuelans, accepting nearly all asylum applications---represents an example of US externalization efforts in action for the Venezuelan case. In January 2022, following pressure from the Biden administration, Mexico imposed new visa restrictions on Venezuelans, reversing its previous policy of allowing visa-free entry (Reuters 2021). The consequences of this policy change were immediately apparent but short lived. In the three months leading up to January 2022, CBP encountered an average of 22,000 Venezuelans monthly; after the policy change, this rate dropped to an average of only 4,000 a month over the following four-month period ending May 2022. However, consistent with our expectations of migrants rerouting and adjusting their behavior to navigate policy impediments, the flow of Venezuelans to the US southern border returned to previous levels and, over the summer and early fall, once again averaged over 22,000 encounters per month.

Initially, the policy change deterred many migrants from traveling through Mexico as they feared apprehension and deportation if encountered without a valid travel permit under the new rules. However, due to the Mexican Commission for Refugee Assistance allocating such a small number of permits (approximately 5,500 between January and May 2022), and owing to limited humanitarian resources in southern Mexico, rather than wait, many Venezuelans instead formed larger caravans and opted to risk the dangers of overland travel to the US southern border (Reuters 2022, IOM 2022).

While the Mexican visa policy change delayed the plans of migrants already in Mexico, it also altered the plans of downstream Venezuelans just starting their migration journey. Whereas Venezuelans had previously flown or taken a bus north to Mexico before continuing to the US southern border, the new visa restrictions created conditions where, to avoid permit checkpoints along roadways and at airports, migrants pursued alternative routes, including through the more dangerous Darien Gap. Indeed, as the human rights research organization and monitor WOLA (2022) observed,

> Since Mexico imposed the visa requirement for Venezuelan nationals in January [2022], making it more difficult for Venezuelans to travel to the country by plane, more and more Venezuelans are reportedly arriving to Mexico by foot to present their asylum cases after traveling through dangerous routes such as the Darien Gap.

The choices made by Venezuelan migrants attempting to reach the US southern border demonstrate the limits of migration policy externalization and the human costs that changing visa policies can

have on those desperate to escape economic hardship and political violence. While US efforts to have Mexico restrict visa conditions for Venezuelan entry did initially prove successful to suppress migrant flows in the short run, as time progressed, the data make clear the temporary nature of that change. Ultimately, migrants observed and responded to the policy change by updating their plans and pursuing their migration goal through other, frequently more dangerous and deadly routes. For Venezuelans in Mexico, the visa change bought limited time, while migrants waited in regions with few humanitarian resources. Meanwhile, for Venezuelans just starting their journey, the change encouraged them to reroute through the dangerous Darien Gap. Ultimately, the result of visa restriction changes remained the same: migrants still arrived, although many more likely suffered along the way.

Tables

Table 01 – Effect directions

Hypothesized effect of transit region visa restriction on encounter response

Visa restriction in:	US southwest	US Caribbean	Darian
Mexico	-	+	+
Central America*	-	+	+
Caribbean	+	-	+
South America	-	+	-
* Excluding Mexico			

Note – in a world with no migrant agency, spatial/temporal deflection and rerouting would not occur and the effects in the above table will all be negative. Stated differently, absent migrant agency in response to migration restrictions, there would not be a rationale for stronger migration restrictions to result in significantly more migrant encounters.

Table 02 – Descriptive statistics main variables

		Obs	Mean	SD	Min	Max
Encounters	US southwest	7644	566.81	3142.55	0	66584
	US Caribbean	7644	1.57	27.86	0	1179
	Darien Gap	7644	118.51	1577.90	0	62700
Passport (Restrict)	Mexico	7644	1.553	0.825	0	2.000
	Caribbean	7644	0.905	0.485	0	1.769
	Central America (no Mexico)	7644	1.175	0.779	0	2.000
	South America	7644	1.195	0.552	0	2.000
Passport (months since restriction)	Mexico	7644	24.794	14.205	0	49
	Caribbean	7644	7.871	11.315	0	49
	Central America (no Mexico)	7644	24.452	14.319	0	49
	South America	7644	2.506	3.689	0	24

Table 03 – Theoretical overview

H	Name	Theoretical functional form*	Expectation(s)
1a	Regional Deterrence	$Arrivals = \beta\, Visa\ Restrict_j$	$\beta_j < 0$
1b	Aggregate Deterrence	$Arrivals = \beta\, Visa\ Restrict_j$	$\sum_{i}^{J} \beta_i < 0;\ where\ i \in \{Mex,\ CA,\ CR,\ SA\}$
2	Spatial deflection	$Arrivals = \beta\, Visa\ Restrict_j$	8 tests (anticipated direction of restrictions summarized below): $\beta_{Mex}^{US\,SW} < \beta_{Mex}^{US\,CR},\ \beta_{Mex}^{US\,SW} < \beta_{Mex}^{DA}$ $\beta_{CA}^{US\,SW} < \beta_{CA}^{US\,CR},\ \beta_{Mex}^{US\,SW} < \beta_{CA}^{DA}$ $\beta_{CR}^{US\,SW} > \beta_{CR}^{US\,CR},\ \beta_{CR}^{US\,SW} \sim \beta_{CR}^{DA}$ $\beta_{CR}^{US\,SW} > \beta_{CR}^{US\,CR},\ \beta_{CR}^{US\,SW} \sim \beta_{CR}^{DA}$
3	Temporal deflection	$Arrivals = \beta_1 Visa\ Duration_j + \beta_2 Visa\ Duration_j^2$	U-shaped: $\beta_1 < 0$ $\beta_2 > 0$
4	Route viability•	$Arrivals = (\beta_1 Visa\ Duration_j + \beta_2 Visa\ Duration_j^2) \times \beta_3 Darian\ Arrivals_{Lag}$	U-shaped: $\beta_1 < 0$ $\beta_2 > 0$ Darian flow amplifies U: $\beta_3 > 0$

Note:
* all models include control variables and fixed effects
• scope: applies only to US arrivals model

Table 04 – Results: Deterrence and Spatial

	(1) US southwest	(2) US Caribbean	(3) Darian Gap
Visa Restrictions CR	2.696**	-1.641	0.466
	[0.605,4.787]	[-3.644,0.362]	[-1.052,1.984]
Visa Restrictions ME	-0.433**	0.101	0.442
	[-0.780,-0.0871]	[-0.310,0.512]	[-0.405,1.290]
Visa Restrictions CA	1.707**	-2.449*	2.958**
	[0.566,2.848]	[-5.187,0.289]	[1.074,4.841]
Visa Restrictions SA	-1.477**	0.397*	-1.716**
	[-2.062,-0.892]	[-0.0179,0.811]	[-2.768,-0.664]
$\sum \beta \ Visa_i$	2.493** [0.331,4.655]	-3.592** [-5.122,-2.062]	2.150 [-0.321,4.621]
Unit and time fixed effects	Yes	Yes	Yes
Lagged encounters	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Observations	7644	7644	7644
Log likelihood	-14239	-2185	-9949
Adjusted R^2	0.193	0.302	0.201

Table 05 – Results SUR

Hypothesis $\left(\beta^{Model}_{Restriction\ region}\right)$	Test statistic
$\beta^{US\ SW}_{CR} - \beta^{US\ CR}_{CR} = 0$	8.64**
$\beta^{US\ SW}_{ME} - \beta^{US\ CR}_{ME} = 0$	2.65
$\beta^{US\ SW}_{CA} - \beta^{US\ CR}_{CA} = 0$	5.75**
$\beta^{US\ SW}_{SA} - \beta^{US\ CR}_{SA} = 0$	28.02**
$\beta^{US\ SW}_{CA} - \beta^{DA}_{CA} = 0$	2.77*
$\beta^{US\ SW}_{ME} - \beta^{DA}_{ME} = 0$	2.58
$\beta^{US\ SW}_{CR} - \beta^{DA}_{CR} = 0$	1.64
$\beta^{US\ SW}_{SA} - \beta^{DA}_{SA} = 0$	0.19
* $p < 0.10$, ** $p < 0.05$	

Table 06 – Temporal

Conditional effect of visa restrictions in Central America/Caribbean and South America on US and Darian Gap encounters 1-, 6-, and 12-months after the restriction goes into effect

	United States		Darian Gap	
	CA/CR	SA	CA/CR	SA
Month 1	-.0399* (.0205)	-.0819** (.0327)	-.0331 (.0326)	.0105 (.1168)
Month 6	-.1293 (.0877)	-.2676** (.0947)	-.1061 (.1287)	-.2348** (.0893)
Month 12	.0061 (.0989)	.0015 (.3990)	.0105 (.1168)	-1.432** (.5612)
* p < 0.10, ** p < 0.05				

Table 07 – Temporal Interactive

Conditional effect of visa restrictions in Central America/Caribbean on US encounters 1-, 6-, and 12-months after the restriction goes into effect with observed Darian encounters at the 20th percentile, Darian encounters at 50th percentile, and Darian encounters at 90th percentile

	Month 1	Month 6	Month 12	Month 24
Darian encounters (20th percentile)	-0.0181 (0.0200)	-0.0361 (0.0781)	0.1009 (0.1091)	0.8947** (0.2947)
Darian encounters (50th percentile)	-0.0313* (0.0169)	-0.1000 (0.0738)	0.0105 (0.0928)	0.8628** (0.2403)
Darian encounters (90th percentile)	-0.0599** (0.0175)	-0.2383** (0.0764)	-0.1854** (0.0919)	0.7938** (0.2194)
* p < 0.10, ** p < 0.05				

Figure 01 – Encounters

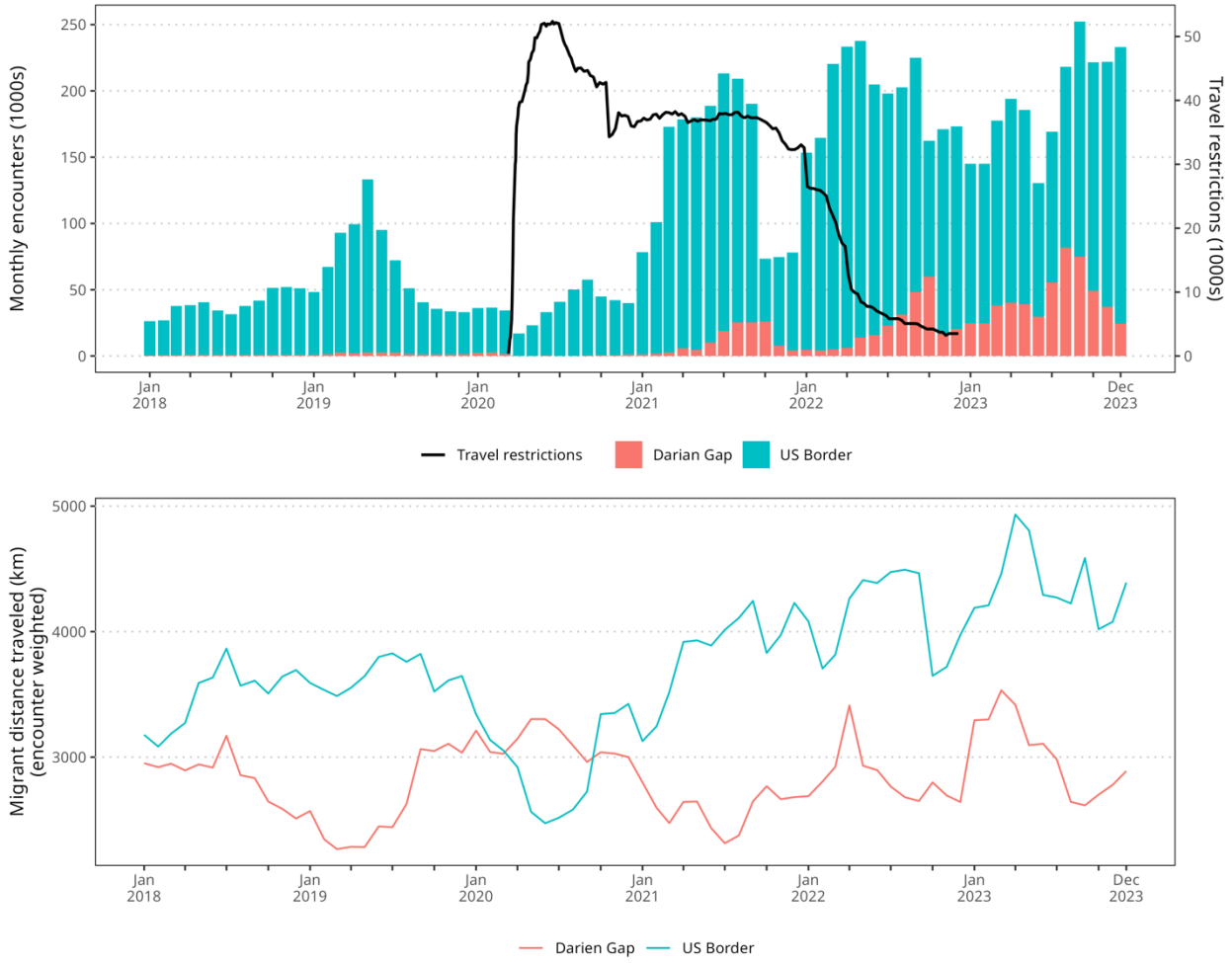

Figure 02 – Duration (conditional effects)

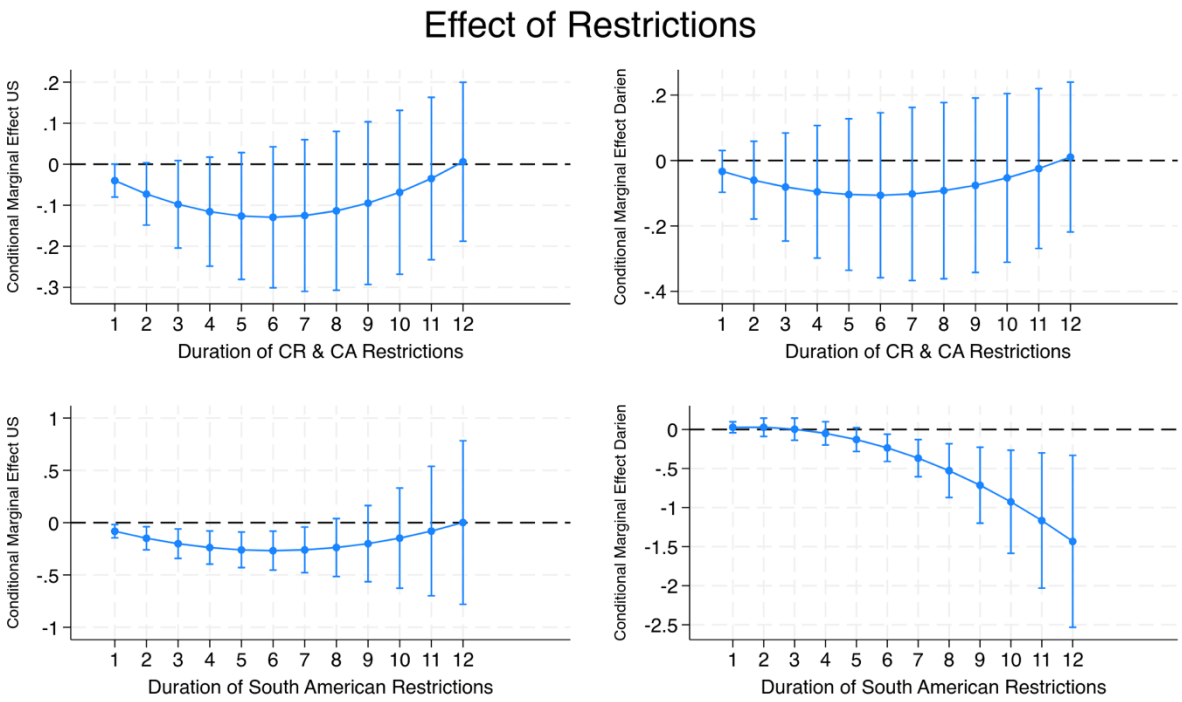

Figure 03 – Duration Cuba (predicted values)

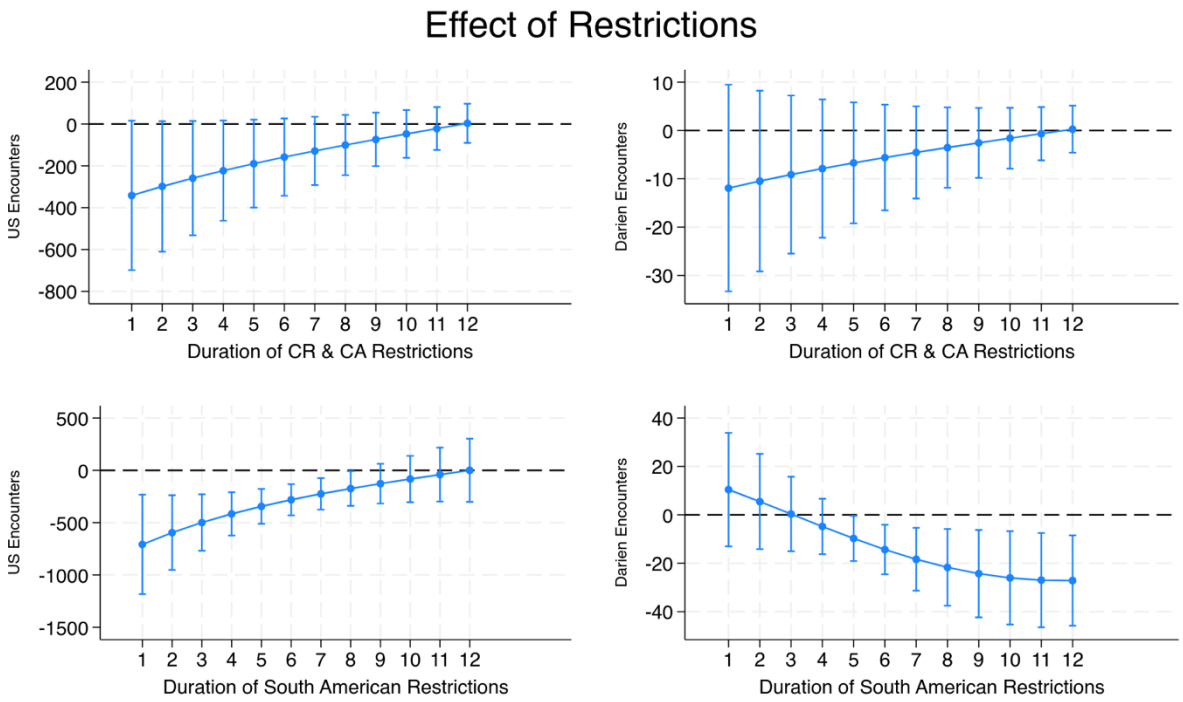

Figure 04 – Route viability (conditional effects)