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Essays on the legacy of COVID-19

Economic Challenges, Migration Dynamics, and Democracy in a New Era

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Essays on COVID-19's Legacy

From Economic Challenges to Migration Dynamics and Voting in a New Era

Jorge Soler-Lopez

Introduction

4.1 Million Migrants, recites a front page article of *The Washington Post* on June 26, 2024, referring to the number of immigration court records in the United States in the past decade. The story illustrates the magnitude of migration, the shifts that have occurred in recent years, and the impact of the COVID-19 pandemic. It shows where migrants come from, how have they incorporated into the economic life of the country, and where they live (Blanco, Rich, Miroff, & Sachetti, 2024).

I bring this number into consideration because it represents about 1.2% of the United States population. If it were the population of a city, it would the 2nd largest of the country, just after New York City (US Census Bureau, 2024). Moreover, the WP story is extremely relevant because it underlines how migration goes hand by hand with many issues that our society faces: First, it highlights the massive shift in migration after the COVID-19 pandemic. In fact, more records were found during the 2021-2024 period than in the previous 5 years. Second, nationality-wise, the share of migrants from Central America and Mexico have dwindled; giving raise to migrants that increasingly come from farther away places, like Venezuela, Haiti, or even China. And third, it highlights the indelible liaison that exists between migration and current politics. Indicating how many groups might be falsely assuming that left-leaning governments are less stringent towards migrants.

How exactly do these issues talk to each other? This dissertation examines the intersection of these phenomena through three distinct studies. Two chapters are focused in the United States while one is centered in Europe. Broadening the empirical scope allows for a more robust analysis. In summary, first, we find that the Covid-19 infection was detrimental for household finances in developed economies. And in many cases, these issues have continued to persist until present day. Second, we find that there is a connection between hunger and migration during and after the pandemic, meaning that heightened food insecurity might be correlated with the current migrant waves in the Southern US border (Customs and Border Protection, 2023). And third, given the growing political importance of migrants in host countries, we find that populist governments may experience a backlash stemming from these very groups. In particular, we see that, under certain circumstances, migrant groups react against anti-immigrant rhetoric by becoming citizens and actively participating in democratic elections.

Infection and Economic distress

Early reports of the pandemic indicated that the economic situation was dire. Policy responses focusing on lockdowns, social distancing and business closures had significant negative effects on economic activity. This is particularly important because the effects of the pandemic were not felt equally across different income, occupation, and wealth levels (Achdut, 2021; Husain et al., 2020).

In fact, in this the first study, we look at the effects of COVID-19 infection on household finances in Europe, focusing on working older adults. We find that individuals with hospitalized household members we more likely to declare that they had problems making ends meet. This is despite all the safeguard policies that the European Union had in place to alleviate the economic downturn. In addition to that, we find that the severity of infection further compounded the issue. For example, individuals who had someone in their household die because of COVID were 2.5 times more likely to declare difficulty making ends meet, compared to those with hospitalized members.

The study is innovative in that it provides a detailed understanding of the unique financial impacts of COVID-19 infections on households. In fact, while migration is often associated with younger individuals, we focus on older adults (50+) because of the timeliness and robustness of the survey, which provided a new way of measuring contagion while guaranteeing statistical soundness. Most other studies focus on the broader economic effects of the pandemic (Menta, 2021; Verwey & Monks, 2021), our research delves into how individual households specifically experienced and were affected by COVID-19. This nuanced approach allows us to uncover the distinct financial strains that households faced, offering a more comprehensive picture of the pandemic's economic toll on working older adults in Europe. By highlighting these disparities, our study contributes to a deeper understanding of the socio-economic consequences of the COVID-19 crisis that can be induced to have been present in younger more mobile cohorts.

From Food Insecurity to Migration

Acknowledging the financial toll of COVID-19 on household finances, we now focus our attention on Food Insecurity in the Second paper. Food insecurity is a critical issue that disproportionately affects poorer countries, exacerbating existing vulnerabilities and driving migration. Individuals in these nations face significant challenges in securing consistent access to sufficient, safe, and nutritious food, particularly during crises such as the COVID-19 pandemic. The resultant food insecurity can act as a powerful push factor, compelling individuals and families to seek better living conditions abroad (Picchioni, Goulao, & Roberfroid, 2022; Smith & Wesselbaum, 2020). The *4.1 million* and the incredible shift in recent years gives account of that push.

Moreover, hunger induced migration is more pronounced in countries with limited economic resources and weak social safety nets, where the impact of food insecurity is more severe and pervasive. Additionally, there are looming concerns of *geoeconomic fragmentation* and "a very strong warning signal" that nations are now drifting apart in economic terms (Gourinchas, 2023). This is particularly the case of developing nations in contrast to developed economies(Le Monde, 2024). These gaps serve both as pull and push factors: wage and economic differences are one of the main issues that motivate migration.

Beyond these factors, pull factors at destination can also have relevant effects on migration flows, and these can be negative. For example, the recent Trump-era reinforcement of immigration controls, restrictions on asylum seekers and generally hard-line immigration policies, has resulted in historic low levels of encounters in the Southern border of the USA. These policies and the subsequent reduction in encounters, however, do not recognize the need for action in the region to tackle poverty and FI.

Migration and Democracy in a post-Covid world

How will the world politics look in a world with more migration? Migration and democracy in a post-COVID world are intricately linked, as the dynamics of migration

have profound implications for democratic processes and political landscapes globally. The increase in migration, driven by factors such as food insecurity, economic instability, and political turmoil, especially in the wake of the pandemic, is reshaping electoral demographics in host countries. Hispanics are the fastest growing ethnic group in the US and first generation citizens compose about 10% of the voters (Kamp & Overberg, 2024). As explored in this study, discrimination and perceived threats can influence naturalization and voting behavior among first-generation immigrants. The 2016 and 2020 presidential elections serve as pivotal examples, showing a significant increase in naturalizations among targeted immigrant groups, such as Mexicans, and a decrease for Chinese. However, voter turnout registered an unprecedented increase in response to hostile political rhetoric and policies. This suggests that immigrant populations are becoming more politically active and engaged, with repercussions on electoral outcomes and policy directions. As migration patterns continue to evolve, the intersection between migration and democracy will play a critical role in shaping the future of global politics. And as migrants are mobilized and continue voting for left-leaning governments, this shift will emphasize the need for policies that promote integration, expand welcoming policies, and ensure the political empowerment of migrant communities.

A call for policy

Our research calls for cooperative efforts on policies on disaster preparedness, food security and migration. The papers presented in this dissertation turn our attention to the lingering impact of COVID-induced poverty and hunger on migration intentions, shedding light on the evolving nature of migration patterns in the face of new crises like inflation and climate change (Cattaneo & Peri, 2016; FAO, 2018). By this logic, we invite concerted efforts from governments, international actors, and non-governmental organizations to invest in preparedness to tackle the threat of food insecurity arising from future shocks. These efforts, besides their normative nature, could be key instruments in mitigating issues deriving from poverty-driven migration.

First, we suggest strengthening food supply chains to ensure their resilience against disruptions. This includes improving infrastructure, enhancing logistical capabilities, and promoting sustainable agricultural practices that can withstand environmental and economic shocks. We are not alone in this suggestion, as a rich body of literature has flourished around this topic (Alabi & Ngwenyama, 2023; Anderson, Mitchell, & Maples, 2021; DuPuis, Ransom, & Worosz, 2022; Hobbs, 2021). By ensuring a steady and reliable food supply, we can reduce the vulnerability of populations to food insecurity. A solid food supply chain can also deter the negative effects of inflation, which continue to be pervasive in developing economies (Rauch-Mannino, 2022; Seivwright, Kocar, Visentin, & Kent, 2024).

Second, we have a need for the implementation of robust disaster preparedness programs. These programs should be designed to anticipate and respond to a range of potential crises, from natural disasters to economic downturns. By allowing communities to have tools and knowledge needed to navigate these challenges, we can enhance their resilience vis-à-vis a world with increasing uncertainty.

Third, we agree with the Committee on World Food Security (2021) assessment on the post-Covid consequences of *Global economic recession and associated income losses* and *Widening societal inequities*. We call for policies aimed at enhancing food security that is inclusive and equitable, ensuring that all segments of the population, particularly

the most vulnerable, have access to sufficient, safe, and nutritious food. This objective can be achieved by direct measures, such as food assistance programs. But also by leveraging on broader initiatives aimed at inclusive growth and reducing poverty.

Fourth, all these policies should go along with a revamping of the current migration system with a more balanced version where people can seek migration opportunities in an institutional and more humane way. Moreover, the changes should be done at sending countries too, that is, there must policies in place to receive and re-incorporate those who return.

Strengthening International Aid

All these efforts have to be taken by both governmental and non-governmental organization. But development organizations like the World Bank and USAID have been, and will continue to be, instrumental in this respect. For example, concerning the first two policy points, USAID's Bureau for Humanitarian Assistance provided important aid to *help address increased needs across northern Central America by improving food consumption and increasing dietary diversity, while simultaneously strengthening the resilience of vulnerable communities that rely heavily on agricultural production.* Just in 2021, about 131 million USD were directed to Covid-19 recovery and emergency funding in Central America.[1] As for the third policy, international aid has been crucial to quickly tackle food crises in the world. The European Civil Protection and Humanitarian Aid Operations (ECHO) is a prime example, directing over a third of the EU humanitarian budget in the past years[2]. Just in Guatemala, ECHO donated more than 2 million euros in 2017. At the same time, Food For Peace (USAID) has donated more than 30 million to the country, in an effort to avert further hunger.

The revamping of the migration system extends beyond the border of receiving countries. In fact, International aid plays a crucial role in supporting "return plans" for migrants, whether they return voluntarily or involuntarily. Countries with more resources, like Mexico, have established institutions such as the *Dirección de Repatriación Digna*, which coordinates with different levels of government, civil society, and the private sector to ensure the safe, orderly, and humane reintegration of repatriated Mexican nationals. However, many lower-income countries lack the financial capacity to implement similar programs without external assistance. For instance, Honduras recently launched the *Regreso Seguro* program with funding from USAID and the International Rescue Committee (IRC).

Finally, International aid plays a crucial role in ringing the alarm on food crises but also brings evidence and data-driven actions that fit into the proposed four policy categories. By supporting research and statistical analysis, aid organizations provide essential insights that inform responses. For instance, the Demographic and Health Surveys (DHS) -funded by USAID, UNICEF, UNFPA, WHO, and UNAIDS- are probably the most important and widely used instruments for tracking health and nutrition in developing countries. But aid is also funneled to national studies, for example, Honduras' National Institute of Statistics (INE) and the International Organization for Migration (IOM), again with USAID's support, developed the 2023 National Migration and Remittances Survey (ENMR)

[1] At the moment of the writing of this document, the USAID website remains unavailable, however, this citation is taken from an archived copy of the USAID/BHA Central America Assistance Overview, September 2024.

[2] See more at https://civil-protection-humanitarian-aid.ec.europa.eu/what/humanitarian-aid/

to generate data on migration dynamics and remittance flows. Such initiatives enable governments, humanitarian actors, and civil society to make informed decisions, ensuring that responses to food insecurity and related crises are targeted, effective, and sustainably.

All these points highlight the need to strengthen aid agencies and ensure their continued role in addressing global challenges. Development organizations not only provide immediate relief but also contribute to long-term resilience by supporting research, data-driven policymaking, and targeted interventions. Strengthening their capacity—through increased funding, better coordination, and strategic partnerships—will allow them to respond more effectively to food crises, migration challenges, and other humanitarian emergencies.

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Chapter 1

COVID Infection and Financial Distress: Results in older adults in Europe

With Manuel Serrano-Alarcon and David Stuckler

Abstract

There are widespread concerns that COVID-19 infection led to substantial economic hardship in affected households and individuals. It is not clear whether the social protection programmes implemented across Europe were sufficient to fully protect at-risk people from economic harm. Here we test the economic impact of COVID-19 infection, hospitalisation and mortality on individuals and households. We use the Survey on Health, Retirement and Ageing (SHARE) COVID-wave covering 6,700 adults aged 50+ who had complete data on financial hardship and were employed prior to COVID-19. Multivariate regression models were used to quantify the association of COVID caseness, symptoms, hospitalization, and death on financial difficulties, adjusting for potential socio-demographic and regional confounders. COVID exposure is strongly associated with greater perceived financial difficulty, and this link increases in magnitude and significance with greater severity of COVID-19 infection. Our models find that COVID-19 symptoms are association with an 8 percentage point (pp) increase ($p<.01$, CI 95%: 0.03, 0.138) in the probability of having difficulty making ends meet; this association increased to 16 pp ($p<.05$, CI 95%: 0.003, 0.321) if someone in the household was hospitalized and 41.5 if someone had died ($p<.05$,

CI 95%: 0.056, 0.823). On conducting mediation analysis, we found job loss could account for a modest part of the link between COVID exposure and financial strain. Our findings provide some of the first evidence that, despite measures to achieve financial protection, COVID-19 infection caused not only health suffering but considerable economic hardship to affected families and individuals. Further research is needed to identify the role of health expenditures and the extent to which they were potentially catastrophic.

1.1 Introduction

Concerns about the impact of the pandemic on the financial capacity of households have been featured prominently, in particular, with regards to job loss. A report by the OECD (2021) in 16 EU countries highlights that almost three quarters of respondents declare facing financial difficulties since the start of the pandemic; while 41% reported disruptions in their jobs, like working fewer hours, being laid off or pay cuts. Early data from employment surveys confirm these stark numbers; in Italy, the first developed country with a significant outbreak, almost 50 percent of workers were idle three weeks into the lockdown (Galasso, 2020). The situation was similar in Israel, where unemployment jumped from 3.4% in February 2020 to 26% by the end of April (Refaeli & Achdut, 2021). In the United States, unemployment peaked at 15% in April, the highest month-to-month increase in more than 70 years (Achdut, 2021; Hertz-Palmor et al., 2020). The severity of the health and economic shock was called the EU's "biggest test since its foundation" and has led to intense debate in the research and political spheres, quickly turning into actionable policies to protect the economy and to deter the negative effects of lockdowns. These have come in the form of unemployment protections, economic support for workers, and liquidity provisions for firms. Moreover, the EU set a block-wide respond in the form a fund consisting of immediate support, and a set of medium- and long-term policies designed to rebuild Europe (Verwey & Monks, 2021) . These coordinated efforts had positive effects in stabilizing the economy and providing a safety network for businesses and workers, but the results are unequal across economic and occupational status. For example, job

disruptions were more extreme for those with less education; the income loss of lockdowns is borne by those who are economically vulnerable; and poverty rates have disproportionally increased for those with a job pre-pandemic (A. Clark, D'Ambrosio, Lepinteur, & Menta, 2021; Menta, 2021). However, there is little information on the effects of localized COVID exposure on individuals and their households. There is evidence linking poverty with higher infection rates (Moreno-Montoya, Ballesteros, & Idrovo, 2022), but there is a lack of literature studying causality and channels. The pandemic might be over, but we see the study of this period as an opportunity to tackle future issues. Hence, we see value in understanding how different types of COVID-19 exposure can impact finances, and the channels through which it acts.

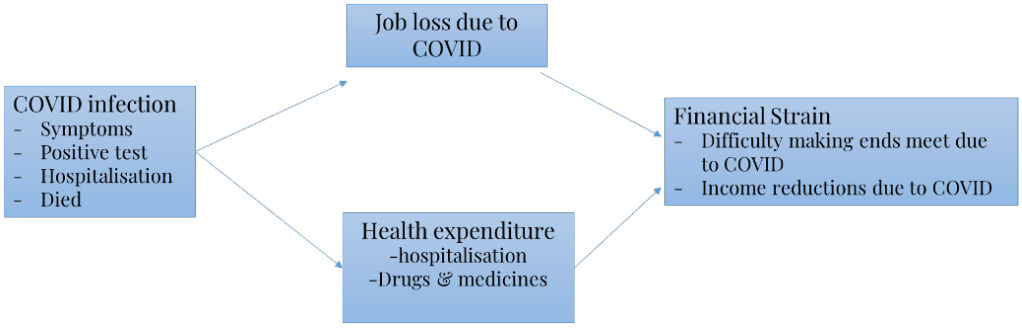
The impacts of health shocks on households have been extensively studied in the literature, with a focus on two main channels: out-of-pocket (OOP) health spending, which we adapt as "Health Expenditures" and loss of productive labor time and earnings, that is "Job loss due to Covid". These avenues are illustrated in Figure 1.1, which provides a conceptual framework for understanding the consequences of health shocks and it's based in extensive literature. (Akazili et al., 2017; Alam & Mahal, 2014; Bergsen, Billon-Galland, Kundnani, Ntousas, & Raines, 2020; McIntyre, Thiede, Dahlgren, & Whitehead, 2006). Households are at risk of incurring health expenditure when they seek treatment for health shocks. The degree to which health expenditure influences finances often depends on the availability of social protection mechanisms. In fact, it's well established that households with access to subsidized public facilities or health insurance coverage tend to have lower health expenses Sriram and Khan (2020).

Health shocks can also lead to a loss of productive labor time and earnings due to illness or death of household members and associated caregiver time. Most of the literature consulted dealt with cases in low- and middle-income countries (LMICs), where formal sector employment is smaller, social protection is limited and the impact on earnings can be significant Alam and Mahal (2014). However, these impacts are still relevant in advanced contexts like Europe, even with robust social networks that can provide protection against

both health expenditure and loss of earnings.

In this paper, we exploit panel data (pre and during COVID) from 26 European countries to examine how individual exposure to COVID affects financial distress. We examine whether, and by how much, the relation between COVID shocks and financial distress is mediated by job loss during the pandemic. To this end, we consider COVID exposure of different types: symptoms, caseness, hospitalisation and death.

Figure 1.1: Hypothesized relationships between COVID infection and Financial Strain



Notes: Author's work using Akazili et al. (2017); Alam and Mahal (2014); Bergsen et al. (2020); McIntyre et al. (2006)

1.2 Data

1.2.1 Source of Data

We use data from the Survey of Health, Ageing and Retirement in Europe (SHARE) (Börsch-Supan, 2022; Börsch-Supan et al., 2013). This is a longitudinal database on health and socioeconomic variables to individuals older and 50 living in Europe and Israel, and representative at the national level. The survey has been applied since 2004 in Europe and Israel for residents over the age of 50, and it is one of the most comprehensive surveys to understand different dynamics in the context of aging. Question rosters may change depending on the wave, but in general, the survey provides relevant information on matters of health, demographics, social networks, employment, social support, financial transfers, consumption, income, assets as well as expectations.

The choice of the survey responds to two practical matters: first, the survey was the first to ask a full set of contagion variables in a systematic manner and over multiple countries. This timely and robust deployment contributes to both the internal and external validity of the study. Second, the survey (in its previous waves) is well established and has been thoroughly used by researchers, guaranteeing its reliability. Limitations to the data exists, namely, the limited scope -working Europeans over 50 years old- and the methodological change, as specified in the next paragraph. However, we believe that the work carries important results, despite these shortcomings.

The survey is typically applied every couple year by means of physical interviews, with the use of *Computer Assisted Personal Interview* (CAPI). A certain percentage of the survey sample is kept as a Panel. The 7^{th} wave was done in 2017, while the 8^{th} wave was done between the end of 2019 and the beginning of 2020. However, the outbreak of the COVID pandemic called for a modification of the methodology and the questionnaire: moving from CAPI to CATI (*Telephone-based interviews*); a different sample size (about 76 thousand surveys were carried in the 7^{th} wave, in contrast to 57 thousand for the CATI part and 46 thousand for the CAPI of the 8^{th}); and with a set of question relevant to the pandemic situation. The resulting 8^{th} Wave is thus divided into the CAPI part, which follows standard procedures and which we will call the pre-COVID round. And the second CATI part, SHARE-Covid19 survey, i.e. *COVID-round*.[1] During summer 2021, a 9^{th} was deployed, also focusing on COVID. However, we use the 8^{th} wave for the results of this paper.

Our initial sample is composed by 57 303 individuals, of which 55 thousand were surveyed mostly during June-July 2020; and 3 thousand up to September -in Austria. We keep those observed in pre and COVID rounds, which brings down the observations to about 36 thousand individuals. We restrict our sample to those employed before the pandemic (11 523 individuals). After this, we drop those with missing information on education, worker status in the pre-COVID round, and different demographic variables. Finally, we

[1] Although the Survey team used the same population mappings and probabilistic methods to make the 8^{th} survey nationally representative, the change in methodology may have negative consequences on the comparisons between Waves, and even between the CAPI and CATI rounds.

keep those who have complete information for the dependent variable. Depending on the level of exposure, we get between 6,683 and 6,703 observations in our working sample. We provide a flowchart for the inclusion criteria in Annex 1, and, a set of summary statistics in Table 1.1.

1.2.2 Construction of the workable dataset

Measuring COVID exposure

We use different measures of COVID exposure depending on a set of questions on COVID-19 status. Respondents were asked if they had *symptoms,* had a *positive result* through a COVID test, were *hospitalized,* or if anyone *died* because of COVID. All questions can refer to the (1) **Individual** level (except for the *death* type); Or, (2) **Household**, meaning self or someone in their household. In total, we use seven dummy variables measuring COVID-19 exposure, three at individual level and four at household level.[2]

To test the validity of our variables, we calculate mean infections per capita given by data from the European Centre for Disease Control (ECDC) cumulative cases in August 2020. Then we calculate the proportion of respondents that reported a positive test, either themselves or for someone they know, by country and by region. The results show a consistent relationship between official and survey figures (See Appendix 6), with correlation at the national level at 0.84 and at the subregional (mostly NUTS2) level being .58. We do the same procedure but using Eurostats' Excess Deaths, and we find similar high correlations.

Measuring Financial Strain

Throughout this paper, we use a typical financial adequacy (Making ends meet) question, which is regarded as subjective. This is preferred to more objective measures of financial distress, like income reduction. It has argued that subjective opinions *are more closely as-*

[2]In the regressions, the baseline includes all other individuals, even those that declare a higher degree of infection. For example, for individuals with self reported symptoms, respondents with positive tests and hospitalizations are included in the baseline (=0). We tested with the exclusion of those individual, and results remain largely the same

sociated with underlying statistical constructs of material hardship than objective measures (Carle, Bauman, & Short, 2008; French & Vigne, 2019; Heflin, 2016). We derived the variable from a Perceived Income Adequacy question. This type of variable has been widely used, even in COVID-related studies (Nelson, Pettitt, Flannery, & Allen, 2020; Refaeli & Achdut, 2021) , and described as culture-neutral, facilitating inter-country comparisons (Fahey, 2007; Maia et al., 2019). The question asks *Would you say that your household is able to make ends meet?* With possible answers being *with great difficulty (1), with some difficulty (2), fairly easily (3), or, easily (4).* We code the variable as 1 when the answer is (1) or (2); and 0 otherwise.

Job Loss: Since the effects of the pandemic and subsequent lockdowns were pervasive in the labor market, we test job loss as a channel for financial deterioration (Casarico & Lattanzio, 2020; Galasso, 2020; OECD, 2020a, 2020b) . We construct a dummy variable based on the question on job loss in the COVID-round questionnaire, *Due to the Corona crisis have you become unemployed, were laid off or had to close your business?.* Thus, this question includes workers, business owners, and self-employed.

Table 1.1: Summary statistics of the sample used (Working sample. N = 6 694)

Panel A: Summary Statistics	Mean/ Percent	SD	Min	Max
Outcome Variable: Making Ends meet				
Difficulty Making Ends Meet During COVID (Dummy)	27.0%	0.44		
Demographics				
Male (dummy)	45.6%	0.50		
Age (in years)	61.7	5.48	50	96
Marital Status/Household				
Lives with partner (dummy)	77.7%	0.41		
Married (dummy)	75.4%	0.43		
Single (dummy)	20.6%	0.40		
Widowed (dummy)	4.0%	0.20		
Household size	2.64	1.18	1	10
Education				
Less than Highschool (dummy)	13.3%	0.34		
Highschool (dummy)	51.4%	0.50		
Tertiary/Advanced degrees (dummy)	35.4%	0.48		
Economic				
Has Supplementary Insurance (dummy)	32.5%	0.47		
Lost Job Because The Pandemic (dummy)	18.5%	0.39		
Difficulty Making Ends Meet (pre-COVID)	29.3%	0.46		
Bottom Quintile* (€/year)	12 052	8409	0	38 400
Second Quintile (€/year)	16 735	11 692	2 209	49 200
Third Quintile (€/year)	24 263	24 263	3 375	64 766
Fourth Quintile (€/year))	29 091	20 715	4 786	86 354
Fifth Quintile (€/year)	49 312	48 324	6 248	820 112

Panel B: COVID Exposure	Mean	SD	Positive Cases	Total Respondents
Someone in the Household with Symptoms	6.7%	0.25	447	6 694
Someone in the Household had Positive Test	2.0%	0.14	135	6 683
Someone in the Household was Hospitalized	0.4%	0.07	29	6 699
Someone in the Household Died	0.1%	0.03	7	6 703
Respondent with Symptoms	2.9%	0.17	190	6 694
Respondent with Positive test	0.8%	0.09	51	6 683
Respondent Hospitalized	0.1%	0.03	8	6 699

Notes: Working sample using the panel structure of wave 8 and the inclusion criteria highlighted in Figure 2, for the case in which someone had symptoms in the Household. Cases indicates the number of respondents that answered 'yes' to that type of exposure. * Quintiles are done at the country level, so the variation of the pooled sample is high and the ranges overlap. Sample sizes vary between 6683 to 6703, due to respondents refusing to answer a question but not another in the COVID exposure rooster. All results presented in the table do not statistically change when using either sample.

Other Variables

Economic variables at baseline: : We create a variable that summarizes the quintiles of income in the sample. For this, we used the question about the respondent's regular monthly income, which is asked in the pre-COVID round:

How much was the overall monthly income, after taxes and contributions, that your

entire household had in a typical month?

We then create quintiles of income, at the national level. Since many observations were missing, we then proceed to create quintiles of income for the missing observations, using SHARE's imputed income database. Finally, we 'fill out' the missing observations of quintiles with the quintiles of the imputed income. We do not mix 'real' income with 'imputed' income before doing the quintiles due to compatibility issues, since incomes may be deflated in one and not in the other.

Survey Control Variables: We include an array of demographic variables (gender, age, marital status); and education variables (using ISCED 2011 standardized levels from SHARE). These controls are necessary to account for differences in socioeconomic background, which can influence financial vulnerability and access to healthcare. Age and gender, for instance, are key determinants of both health risks and economic stability, particularly in the context of the COVID-19 pandemic (Su, Dai, Ullah, & Andlib, 2022). Marital status and household size help capture the role of social support networks, which may buffer financial shocks. We also include a dummy variable indicating if the individual has supplementary insurance. Research indicates that supplementary insurance has a positive effect in reducing OOP expenditures and overall financial burden (Sriram & Khan, 2020)

External COVID related variables: we include a variable for excess deaths per capita at the regional level (NUTS2 or NUTS1, depending on the country) from Eurostat; and another one for the average stringency level of the lockdown measures, using the Oxford measure for stringency and by the middle of the month of the interview (Hale et al., 2021).

GDP at the regional level: We include GDP per capita at NUTS2 (or NUTS1 when not possible) using information from Eurostat. Observations that do not have information on NUTS region are assigned the national level GDP.

1.3 Methods

This section explores the statistical model following the relation presented in Figure 1. First, to account for the relation between COVID exposure and financial strain we estimate the following equation using a Linear Probability Model:

$$\text{FinancialStrain}_{\ i} = \beta_1\ \text{CovidExposure}_{\ i} + X_i\gamma + Y_i\delta + \Psi_i + e_{1i} \tag{1.1}$$

Where, as discussed in the previous section, *FinancialStrain* is a dummy variable determined by *difficulty making ends meet;* and *COVIDExposure* refers to any of the seven combinations of exposure. X is a vector including the economic variables at pre-COVID SHARE round; and Y is vector for the rest of control variables. We include country fixed effects (Ψ) to control for common factors at country level (A list of countries is provided Appendix 6). Standard errors for all regressions are robust.[3]

We expect β_1 , which reports the effect of Covid Exposure on Financial Strain, to be positive and significant.

Mediation Analysis

We then use a mediation analysis method considering whether Job Loss acts as a mediator between COVID exposure and financial strain. A mediation analysis helps uncover the possible participation of a mediator variable in the relationship with two variables. For this, we use Baron and Kenny's 3 step method (Baron & Kenny, 1986; MacKinnon, Lockwood, Hoffman, & West, 2010; Zhao, Lynch, & Chen, 2010) . In addition to Equation 1.1, we additionally estimate the following equations:

$$\text{FinancialStrain}_{\ i,t} = \beta_0\ \text{JobLoss}_{\ i,t} + \alpha_1\ \text{CovidExposure}_{\ i,t} + X_{i,t}\gamma + Y_{i,t-1}\delta + \Psi_i + e_{2i} \tag{1.2}$$

[3] As discussed in *A Practitioner's Guide to Cluster-Robust Inference* (Cameron & Miller, 2015), the choice of clustering standard errors depends on underlying assumptions about heteroskedasticity and potential within-group correlation. Given the structure of the data, we opted for robust standard errors as a primary approach. However, we also experimented with different clustering strategies, including clustering at alternative levels, and found that the results remained largely consistent.

$$\text{JobLoss}_{\ i,t} = \beta_2\ \text{CovidExposure}_{\ i,t} + X_{i,t}\gamma + Y_{i,t-1}\delta + \Psi_i + e_{3i} \tag{1.3}$$

If job loss mediates the relation between Covid exposure and financial stress, the coefficient should be greater in Eq [1] than in Eq [2] . Ie, $|\beta_1| > |\alpha_1|$

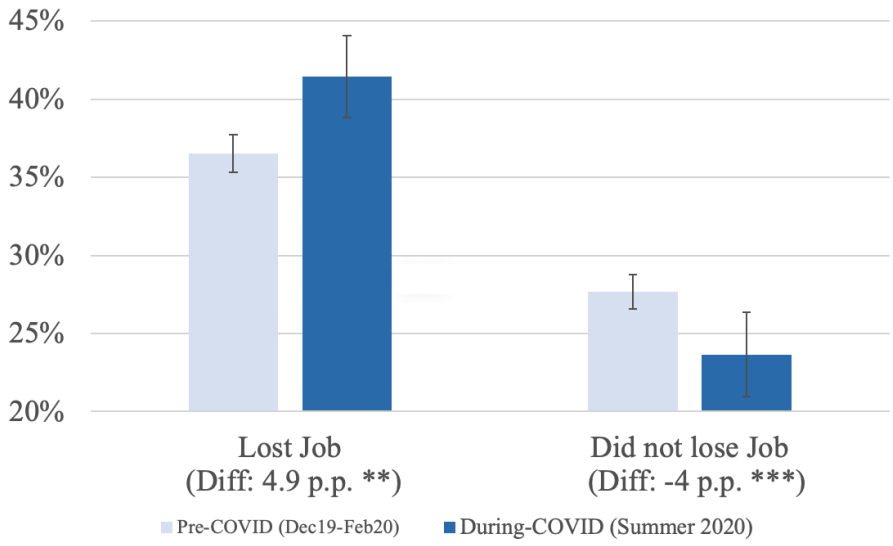
Further, Equation [3] provides the first leg of the scheme in Figure 1, in which COVID exposure first affects job loss. If job loss indeed mediates the relation, we would expect β_2 coefficient to be positive and significant.

1.4 Results

Summary statistics are reported in Table 1. Overall, respondents declare less difficulty making ends meet pre-COVID (29.3%) than during COVID (27%). These surprising results might stem from households finding it easier to pay for goods they prioritize during the first wave of the pandemic, like food. In the absence of needing to buy clothing, transportation, and leisure, households may legitimately be having an overall easier time paying bills. However, the picture is different when we divide by job loss status (see Figure 2). Individuals who lost their job during COVID saw an increase of almost 5 percentage points (pp) in the difficulty of Making Ends Meet. In contrast, those who did not lose their jobs experienced a reduction of their difficulty making ends meet of about 4pp. Second, without controlling for any other variable, the two groups (lost job vs. not) have significantly different patterns of pre-COVID difficulty making ends meet (36 vs. 28 percent, respectively); indicating that the two groups might be systematically different, with those losing their jobs being more vulnerable to health shocks.

We also point to the prevalence of COVID exposure, which is useful to understand the number of cases. Results in table 1.1 show that the most prevalent level of COVID exposure is the one referring to symptoms (6.7% - 453 cases). This is expected as individuals may reply *yes* if they have any COVID-related symptoms, even in the absence of testing. On the other hand, the least prevalent level of exposure is deaths inside the Household (0.1% - 7 cases).

Figure 1.2: Difficulty making ends Meet by Job Loss Status



Notes: Each graph indicates the simple proportion of the Difficulty Making Ends Meet, for both the Pre-COVID and during COVID periods, by whether the individual indicated losing their job because of the pandemic. 95% confidence intervals using a logit regression are indicated as lines. Additionally, difference indicates the point estimate difference of the Difficulty Making Ends meet, inside the lost job categories; asterisks are provided for the test of hypothesis of the difference.

1.4.1 Controls means

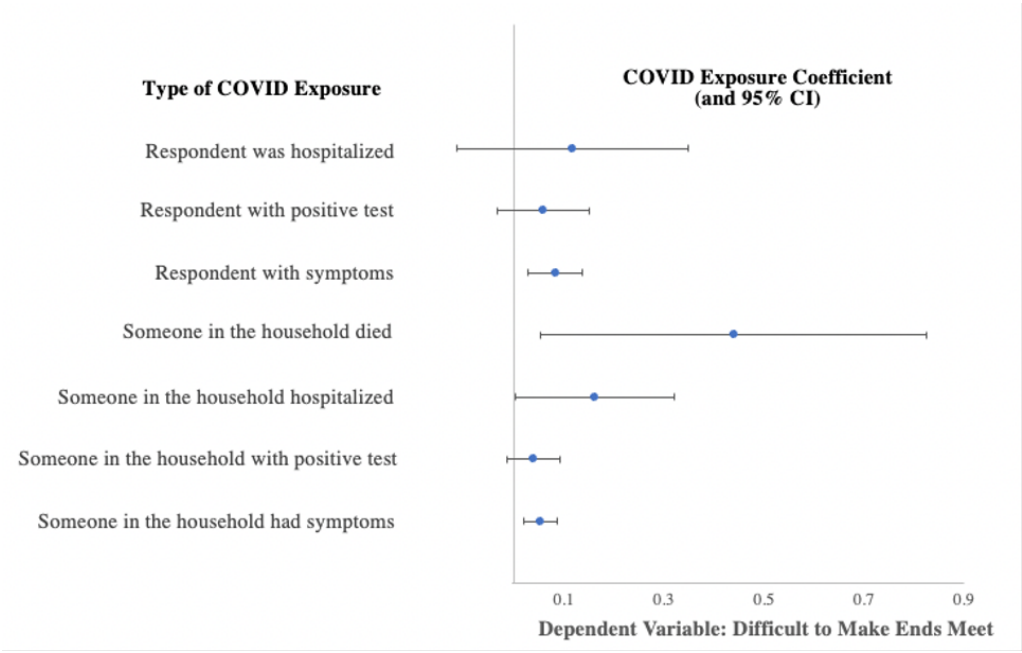
Table 1.1 also presents summary statistics for key demographic and socioeconomic control variables. The sample consists of 45.6% male respondents, with an average age of 61.7 years (ranging from 50 to 96). In terms of household composition, 77.7% of respondents live with a partner, and 75.4% are married. These samples might not be strictly equivalent to population values, although the survey includes weights to do so. For example, women comprise about 54.2% of the population over 50 according to Eurostat, while the employment ratio is about 0.83, meaning women comprise 45% of the labor force in that age. This is in contrast to our sample, which is 54%.

1.4.2 COVID exposure and financial strain

Figure 3 shows association between each level of COVID exposure and financial stress derived from Equation 1, after adjusting for all controls. Our results indicate that being

exposed to COVID hurts financial status. Furthermore, this effect varies in both magnitude and significance depending on the nature of the exposure. The effects seem to increase as the exposure is more severe. For example, someone with COVID symptoms in the household, had a 5.3 pp increase in declaring financial difficulty; while if someone in the household dies, the increase is 43.9 pp. Having someone hospitalized in the household is related with at increase in 16.2 pp of financial difficulties ($p<0.01$, $p<0.01$ and $p<0.05$, respectively). Large confidence intervals in the case of death and hospitalization (self) are due to the small number of people reporting having a person die in their Households (7 respondents); and the respondents having been hospitalized (8 people). However, the results still hold at a 5% level.

Figure 1.3: Forest Plot for the COVID Exposure Variable.



Notes: Adjusted association between COVID exposure and Difficulty making Ends meet, by type of exposure. Each row represents a different regression, with point estimates from the full model of Eq [1] described in section 3 [β_1]. Lines denote 95% Confidence Intervals. Full results of these regressions are reported in the annexes.

On the other hand, unadjusted results (Table 1.4) showed no relation between COVID exposure and financial strain, or even a negative relation for hosehold symptoms. Indeed, this is a confirmation that there are many factors related with both COVID exposure and

financial symptomps, such as baseline economic situation or COVID incidence in the area of residence. Thus, this indicates the necessity of adding controls, which we do for all the subsequent regressions.

1.4.3 Mediation of Job Loss

Table 1.2 and 1.3 summarizes the coefficients and statistical values necessary to test the mediation effect of job loss. Tables 1.5-1.7 contain all the coefficients for the equations [1]-[3] presented in the Statistical Model section. In the case of mediation, we expect the coefficient of Equation [2] to be smaller (in absolute value) than the one in Equation [1]. This is the case for all types of exposure, suggesting that Job Loss is, in fact, a channel through which COVID affects the finances of workers. However, the magnitude and the significance of the mediation are heterogeneous. For example, the only case in which COVID statistically affects Job Loss (Equation [3]) is in the case of Hospitalization in the Household, where it increases the probability of losing the job by approximately 18.6 percentage points.

Table 1.2: Panel A: Summary of regression results of the three equations in the Mediation Analysis

Equation and Dependent Variable	**Type of Exposure, Coefficient of Exposure**						
	Self			**Household**			
	Sympt.	**Pos. test**	**Hospita.**	**Symptoms**	**Pos. test**	**Hospita.**	**Death**
Eq [1]: Ends Meet (β1)	0.083***	0.059	0.118	0.052***	0.038	0.162**	0.439**
	(0.028)	(0.047)	(0.169)	(0.017)	(0.027)	(0.081)	(0.197)
Eq [2]: Ends Meet (α1)	0.080***	0.054	0.143	0.050***	0.037	0.143*	0.42**
	(0.028)	(0.045)	(0.078)	(0.017)	(0.026)	(0.079)	(0.205)
Eq [3]: Job Loss (β1)	0.028	0.050	0.198	0.032	0.006	0.186*	0.182
	(0.030)	(0.058)	(0.175)	(0.020)	(0.034)	(0.095)	(0.192)

Notes: Each cell contains the point estimate of the COVID exposure for different regressions. Equations [x] refers to the equation numbering in the Methods section. [2] is the full regression, including the mediator and all controls. [1] does not include the mediator. [3] refers to the regression of the mediator on all controls. Standard Errors are in parenthesis, while asterisks denote significance levels, where * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 1.3: Panel B: Summary of the results on the mediation effect and different tests

Mediation Effect of Job Loss	**Type of Exposure**						
	Self			**Household**			
	Sympt.	**Positive**	**Hospital.**	**Sympt.**	**Positive**	**Hospit.**	**Died**
Proportion of total effect that is mediated	0.07	0.087	0.172	0.061	0.02	0.117	0.044
Mediation Tests (z-Values, significance given by stars)							
Sobel	0.923	0.845	1.220	1.562	0.184	1.900*	0.961
Aroian	0.916	0.839	1.112	1.551	0.183	1.887*	0.955
Goodman	0.930	0.852	1.129	1.574	0.186	1.914*	0.968

Notes: The first row of value indicates the portion of the relationship between COVID and financial strain that is explained through the Job Loss Channel, which is equivalent $\beta_1/\alpha_1 - 1$.The last three rows are the z-values of the test of hypothesis of the proportion, indicating whether it is significantly different from zero. Asterisks denote significance levels, where * p < 0.1, ** p < 0.05, *** p < 0.01.

We can quantify the mediation effect by looking at the coefficients of the mediation versus the un-mediated equations and perform tests [4] on whether the mediation is significant. These results are summarized in Panel B. First, we see that financial strain is weakly mediated by job loss in most cases, except in hospitalizations. In the case of someone in the household being hospitalized, Job Loss accounts for the 11.7 percent of the total effect of COVID on Financial Strain. This relationship is further confirmed by the three tests (Sobel, Aroian and Goodman), which are significant at a 10% level. If the respondent herself was hospitalized, the mediation is around 17.2 percent. However, due to the small numbers in this category, we cannot formally test for this relationship. We see these results as a validation of the mediation hypothesis in the case of hospitalization, which is when individuals are more prone to lose their job. Individuals with hospitalizations in the household loss their jobs because they might have to devote time to caregiving, effectively cutting them from the labor market. Our mediation analysis leaves unexplained about 88 percent of the effect on COVID in Financial distress, which we attribute to other channels, like the direct costs of hospitalization, medicines, and caring for others, or other economic looses that do not imply necessarily job loss, such as salary cuts or drop in

[4]We perform all calculations using Stata 17 for macOS (Apple Silicon Version). Moreover, we used Trenton Mize's sgmediation2 Stata command to check results, provide hypothesis testing (Sobel, Aroian and Goodman tests), and calculate the magnitude of the mediation effect (Mize, 2020). We provide the three tests that the sgmediation2 command outputs. In our case, they all provide the same results. However, in case of disagreement, MacKinnon et al. 2002 provide a discussion of each test.

business revenues.

1.5 Robustness checks

We perform several robustness checks to our analysis. First, we employ a different measure of financial strain, namely, *income reduction*. This variable takes a value of 1 if the respondent declares a negative difference between their normal wage or income, and their minimum income during the COVID panemic. Results are presented in Appendix 7. Even if the magnitude of the results is different from the ones using making ends meet; they are in the same direction: more significant exposure to the virus (like hospitalization or death) is associated with higher probability of income reduction. The mediation of job loss is now even higher, explaining about a third of the effect (30.8%) in the case of hospitalization in the household. This is expected, as job loss and income are directly related, more than subjective financial status. Although these results are very interesting by themselves, we focused on the subjective financial strain because of the high variability and lower sample size of income variables.

Second, we repeated the analysis excluding Austria. This is because fieldwork there was mostly done during August and September 2020 (instead of June and July), when lockdown restrictions have mostly relaxed. The reduction on the number of observations is minimal (around 200 observation, or less than 3% of the sample) leading to about 6 490 observations. We present the regression results in Appendix 8. They remain basically unchanged, with little change in the magnitude of the coefficients.

Third, we repeated the analysis using binary regressions (logit). In this case, mediation analysis is not easily interpretable and only the full equation is presented in Appendix 8. Results are similar to the linear regressions, with signs following the same pattern.

Fourth, we repeated the analysis accounting for the intensive margin of the loss of employment. In this case, the job loss variable takes a value of 0 if the person did not lose their job, and if they did, it takes the number of weeks that the person was not working. Results are presented in Appendix 9. As before, point estimates for the COVID exposure

variable do not statistically change.

1.6 Discussion

The present study sheds light on the association between financial strains and COVID-19 exposure by using data first collected right before the beginning of the pandemic and continuing during its first wave. Our results indicate a correlation of COVID symptoms, deaths and hospitalizations on financial stress, as measured by difficulties making ends meet. This happened despite COVID care being freely available in the European countries investigated. Moerover, we found that the association of COVID with economic hardship was only partly mediated by job loss. This suggests that although many countries have attempted to protect the economy from shedding jobs during COVID, this has been insufficient to fully buffer populations from economic difficulties.

Our results are consistent with the current literature on the economic consequence of health shocks and illnesses. Illness is associated with decreased labor supply and income: in Taiwan, heart disease is associated with a reduction of 27.3% of Labor Force participation Mete and Schultz (2007); while in China deterioration in subjective health lead to up to a 10% income loss and 15% decrease in Labor Force participation. There is also evidence of larger health shocks associated with greater economic distress; for example, in Vietnam, death of a working age member lead to a reduction of earned income as high as 36% (Alam & Mahal, 2014).

These results are also present in the European context. Studies examining the financial fragility of households during the COVID-19 pandemic in Europe have found similar patterns. For instance, research on households in France, Germany, and other European countries has shown that reduced or lost employment and COVID-19 infection, are associated with higher levels of both objective and subjective financial fragility K. T. Kim, Xiao, and Porto (2024); Kleimeier, Hoffmann, Broihanne, Plotkina, and Göritz (2023).

Mediation analysis uncovers job loss as a channel, although weak, in the case of hospitalization, but not death. This is explained by, (1) hospitalization causing first-order job

cessation for workers and self-employed, and closures for business owners. And (2) the job loss effect being compounded by non-hospitalized household members taking care of those hospitalized. These two explanations are less clear in the case of death, for which job loss is not a channel. In this case, we have that (1) individuals may continue to work, but face the burden of unexpected catastrophic expenditures, like funeral costs. And (2) deaths tend to be concentrated on older individuals, which are more likely to be pensioners. This means that the household experiences a (temporary) decrease in income, but not a job loss.

In the extreme cases of hospitalizations and death, individuals have a double burden of economic and health harm, and governments stimuli may not be enough to assure economic protection. For example, in the case of hospitalization, self-employed individuals and small business owners may not be eligible for income-protection schemes. In the case of death, funeral costs can cause a great toll on household finances, despite some jurisdictions implementing subsidies.

Importantly, our study focused on older adults, a population that is most vulnerable to COVID-19 infection but also thought to be better protected economically, thanks to pension supports and social programmes. Our focus is relevant in the context of an aging continent, where almost 35 percent of the population is 50 or older European Commission (2020). Conducting the same regressions with the individuals who are pensioners leads to non-significance of the COVID exposure coefficient, supporting the hypothesis of financial protection of steady-income from pensions.

Study Limitations

We identified several limitations in our study. First, COVID exposure might be caused by several unobserved variables at individual level. This raises an issue of endogeneity of the COVID exposure variable that we do not fully address here. In fact,financial distress could be in itself determining COVID infection (for example, working as a supermarket cashier versus doing home office). However, we control for a range of socioeconomic

variables both pre and during COVID in order to attenuate this issue. Second, there may be bias problems with the survey: (i) Changes between the CAPI and CATI rounds can lead to differing responses. We found, for example, that incomes varied widely between the two rounds. However, we calculated the Spearman correlation of several before and during COVID cofounders, and they were high and significant. (ii) There could be bias between those respondents who did the two rounds and those who only did the COVID round. We calculated means, and found that demographics were mostly similar, but economic variables had small differences. We identified an updward bias, with individuals with higher structural economic status being most likely to answer both rounds. Given our controls, we can assume that our results are a lower bound. These biases curtail our ability to generalize results to the population. A third limitation comes from the number of individuals and households with hospitalizations and deaths being low, which is detrimental for statistical power. In the case of death, we only have 7 cases, which makes our confidence intervals very wide, although they are significant at $p<.05$. In particular, given the small number of observation, the results of the mediation analysis, although significant, should be taken carefully. More data would be needed in these cases.

Finally, another limitation comes from the heterogeneity of the countries in the sample. The extent of COVID-19 exposure varied widely across countries and even across sub-national regions, influenced by factors such as population density, healthcare infrastructure, and public health policies. Our regressions pooled all countries together and the models try to control for this heterogeneity by using country fixed-effects. However, we acknowledge that results might vary significantly, specially given the different government responses, and previous structural economic variables.

Policy Implications

Notwithstanding these limitations, our findings show the harmful effects of COVID exposure in terms of financial strains. These results highlight the importance of European Countries maintaining their furlough, income support and business support programs in

order to avoid mass layoffs reduce economic harpship.

On the other hand, however, the fact that the relation between COVID exposure and financial hardship is only partially mediated by job loss, indicates that government support measured should have been amplified to more dimensions. Initiatives like subsidies for funerary expenses can be implemented nationwide. Also, additional support to relatives providing caregiving to those who become severly ill and need hospitalization.

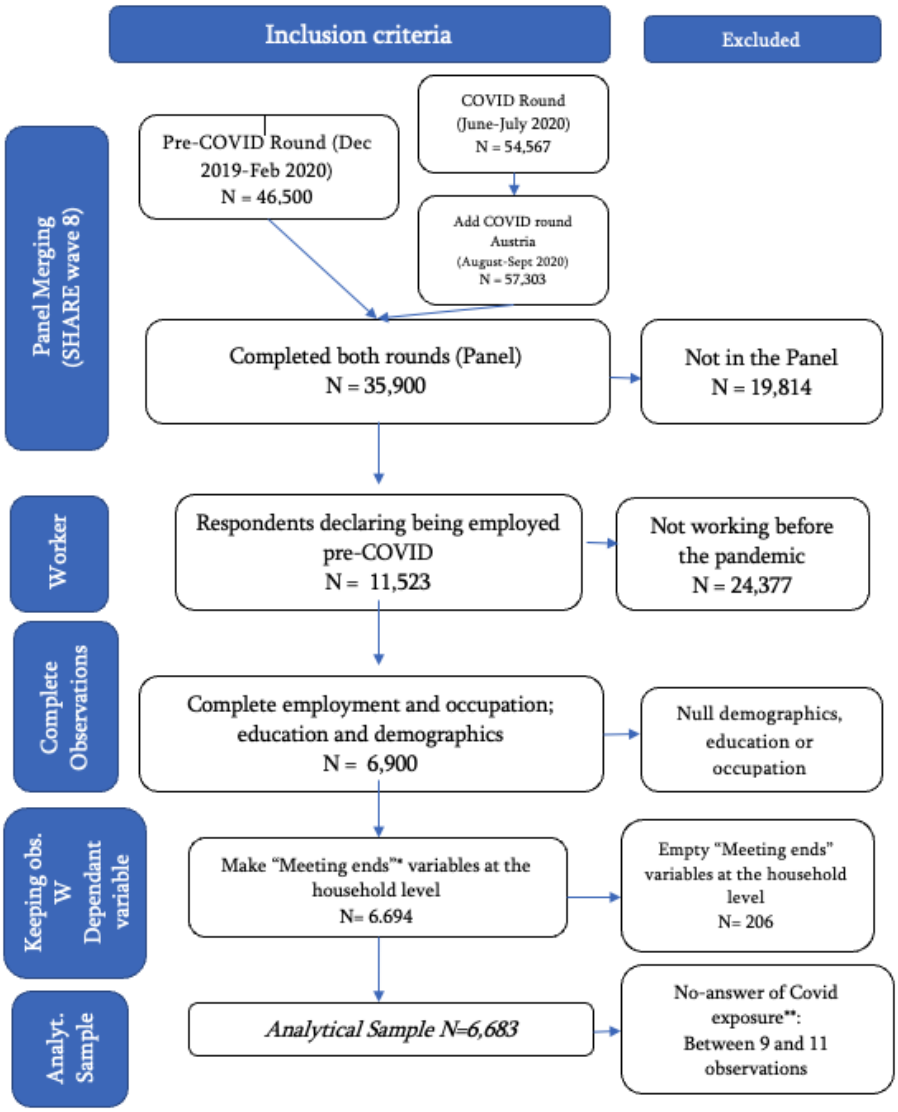
Research Implications

We identify several avenues for future research. First, more information is needed to understand the effect by disaggregating by the type of worker (self-employed, business owner) or occupation (blue collar or white collar). This is important given that schemes are difficult to access for business owners and informal workers. Second, studies can concentrate on the channels, besides job loss, that mediate the relationship. We proposed a few channels, like health expenditures, caregiving activities in-lieu of work; but other channels can be understood with qualitative work.

1.7 Appendix

Flow Diagram for Sample Inclusion

Figure 1.4: Flow Diagram for Sample Inclusion



Notes: * *Making ends meet* questions are asked only to one member of the household. Thus, they should be assigned to all members of the household. ** The final analytical ranges between 6683 and 6703 observation

Appendix 2

Table 1.4: Regressing Financial Difficulty on Exposure alone

Dependent Variable: Financial Difficulty	**Type of Exposure**						
	Self			**Household**			
	Sympt.	**Positive**	**Hospital.**	**Sympt.**	**Positive**	**Hospit.**	**Death**
Covid Exposure	-0.022	-0.073	0.107	-0.079***	-0.077**	0.042	0.303
	(0.032)	(0.056)	(0.171)	(0.020)	(0.034)	(0.086)	(0.187)
Constant	0.269***	0.269***	0.268***	0.274***	0.270***	0.268***	0.268***
	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)
Observations	6694	6683	6699	6694	6683	6699	6703

Notes: Standard Errors are in parenthesis, while asterisks denote significance levels, where * p $<$ 0.1, ** p $<$ 0.05, *** p $<$ 0.01.

Appendix 3

Table 1.5: Regressions of Financial difficulty using the full set of controls, but without the Mediator (Equation 1)

Dependent Variable: Financial Difficulty	**Type of Exposure**						
	Self			**Household**			
	Sympt.	**Positive**	**Hospital.**	**Sympt.**	**Positive**	**Hospit.**	**Death**
Covid Exposure	0.083***	0.059	0.118	0.053***	0.038	0.162**	0.439**
	(0.028)	(0.047)	(0.169)	(0.017)	(0.027)	(0.081)	(0.197)
Male (==1)	-0.002	-0.004	-0.004	-0.002	-0.004	-0.004	-0.004
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Age (in years)	0.003	0.004	0.004	0.003	0.004	0.004	0.003
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Lives in Couple	-0.020	-0.018	-0.019	-0.020	-0.019	-0.020	-0.019
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Married (==1)	0.011	0.010	0.011	0.011	0.011	0.012	0.012
	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
Single (==1)	0.012	0.011	0.012	0.012	0.011	0.013	0.013
	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
Household size	0.006	0.006	0.006	0.006	0.006	0.006	0.006
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Less than Highschool	0.079***	0.079***	0.080***	0.079***	0.079***	0.080***	0.080***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Highschool	0.046***	0.046***	0.046***	0.046***	0.046***	0.046***	0.046***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Age Squared	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Diff. Meeting Ends HH (pre-COVID)	0.356***	0.353***	0.355***	0.356***	0.353***	0.355***	0.354***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.015)	(0.014)	(0.014)
Has Suplementary Insurace	-0.028**	-0.027**	-0.028**	-0.029**	-0.027**	-0.027**	-0.028**
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
II Quintile	-0.041**	-0.040**	-0.040**	-0.040**	-0.040**	-0.040**	-0.042**
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
III Quintile	-0.065***	-0.067***	-0.065***	-0.066***	-0.066***	-0.065***	-0.067***
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
IV Quintile	-0.099***	-0.099***	-0.098***	-0.099***	-0.099***	-0.099***	-0.100***
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
Top Quintile	-0.008	-0.008	-0.009	-0.008	-0.008	-0.009	-0.010
	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)
Log Regional GDP Cap	0.027	0.028	0.028	0.026	0.028	0.028	0.029
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
Excess deaths per 1000 people	0.002	0.002	0.001	0.002	0.002	0.002	0.002
	-0.041**	-0.040**	-0.040**	-0.040**	-0.040**	-0.040**	-0.042**
Average stringency index by time of interview	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
	-0.065***	-0.067***	-0.065***	-0.066***	-0.066***	-0.065***	-0.067***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6694	6683	6699	6694	6683	6699	6703

Notes: Standard Errors are in parenthesis, while asterisks denote significance levels, where * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Each column reports results from a different regression, where the dependent variable is difficulty making ends meet. Robust standard errors clustered at household level. Omitted reference groups are for Education: Tertiary Education; for National Income: the 1st quantile of Income; for marital Status: widowed.

Appendix 4

Table 1.6: Regressions of Financial difficulty using the full set of controls, with the Mediator (Equation 2)

Dependent Variable: Financial Difficulty	**Type of Exposure**						
	Self			**Household**			
	Sympt.	**Positive**	**Hospital.**	**Sympt.**	**Positive**	**Hospit.**	**Death**
Covid Exposure	0.080***	0.054	0.098	0.050***	0.037	0.143*	0.420**
	(0.028)	(0.045)	(0.161)	(0.017)	(0.026)	(0.078)	(0.205)
Lost job because of the pandemic	0.102***	0.101***	0.103***	0.102***	0.102***	0.103***	0.103***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Male (==1)	0.001	-0.000	-0.001	0.001	-0.000	-0.001	-0.001
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Age (in years)	0.003	0.004	0.003	0.003	0.004	0.004	0.003
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Lives in Couple	-0.020	-0.018	-0.018	-0.020	-0.018	-0.019	-0.019
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Married (==1)	0.009	0.008	0.009	0.009	0.008	0.009	0.010
	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
Single (==1)	0.010	0.009	0.011	0.011	0.009	0.012	0.011
	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
Household size	0.010	0.009	0.011	0.011	0.009	0.012	0.011
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Less than Highschool	0.079***	0.079***	0.080***	0.079***	0.079***	0.080***	0.080***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Highschool	0.046***	0.046***	0.046***	0.046***	0.046***	0.046***	0.046***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Age Squared	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Diff. Meeting Ends HH (pre-COVID)	0.356***	0.353***	0.355***	0.356***	0.353***	0.355***	0.354***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.015)	(0.014)	(0.014)
Has Suplementary Insurace	-0.028**	-0.027**	-0.028**	-0.029**	-0.027**	-0.027**	-0.028**
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
II Quintile	-0.041**	-0.040**	-0.040**	-0.040**	-0.040**	-0.040**	-0.042**
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
III Quintile	-0.065***	-0.067***	-0.065***	-0.066***	-0.066***	-0.065***	-0.067***
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
IV Quintile	-0.099***	-0.099***	-0.098***	-0.099***	-0.099***	-0.099***	-0.100***
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
Top Quintile	-0.008	-0.008	-0.009	-0.008	-0.008	-0.009	-0.010
	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)
Log Regional GDP Cap	0.027	0.028	0.028	0.026	0.028	0.028	0.029
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
Excess deaths per 1000 people	0.002	0.002	0.001	0.002	0.002	0.002	0.002
	-0.041**	-0.040**	-0.040**	-0.040**	-0.040**	-0.040**	-0.042**
Average stringency index by time of interview	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
	-0.065***	-0.067***	-0.065***	-0.066***	-0.066***	-0.065***	-0.067***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6694	6683	6699	6694	6683	6699	6703

Notes: Standard Errors are in parenthesis, while asterisks denote significance levels, where * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Each column reports results from a different regression, where the dependent variable is difficulty making ends meet. Robust standard errors clustered at household level. Omitted reference groups are for Education: Tertiary Education; for National Income: the 1st quantile of Income; for marital Status: widowed.

Appendix 5

Table 1.7: Regressions of Job loss using the full set of controls (Equation 3)

Dependent Variable: Job Loss	**Type of Exposure Self**			**Household**			
	Sympt.	**Positive**	**Hospital.**	**Sympt.**	**Positive**	**Hospit.**	**Death**
Covid Exposure	0.028	0.050	0.198	0.032	0.006	0.185*	0.182
	(0.030)	(0.058)	(0.175)	(0.020)	(0.034)	(0.095)	(0.192)
Male (==1)	-0.030***	-0.032***	-0.031***	-0.030***	-0.032***	-0.031***	-0.030***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Age (in years)	0.000	0.001	0.001	0.000	0.001	0.001	0.001
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Lives in Couple	-0.005	-0.005	-0.005	-0.005	-0.005	-0.006	-0.004
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Married (==1)	0.022	0.022	0.022	0.023	0.023	0.023	0.022
	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)
Single (==1)	0.013	0.014	0.012	0.013	0.014	0.013	0.012
	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
Household size	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Less than Highschool	0.058***	0.059***	0.058***	0.059***	0.059***	0.058***	0.059***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
Highschool	0.063***	0.063***	0.063***	0.063***	0.063***	0.064***	0.063***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Age Squared	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Diff. Meeting Ends HH (pre-COVID)	0.020	0.022*	0.021*	0.020	0.021*	0.021*	0.020
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Has Suplementary Insurace	-0.017	-0.018	-0.016	-0.017	-0.018	-0.016	-0.017
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
II Quintile	-0.038*	-0.038*	-0.035	-0.038*	-0.038*	-0.035	-0.037*
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
III Quintile	-0.033	-0.031	-0.030	-0.033	-0.031	-0.031	-0.032
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
IV Quintile	-0.041**	-0.039*	-0.038*	-0.041**	-0.039*	-0.038*	-0.039*
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
Top Quintile	-0.046**	-0.044**	-0.042**	-0.046**	-0.044**	-0.043**	-0.044**
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
Log Regional GDP Cap	0.042	0.042	0.041	0.042	0.042	0.041	0.041
	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)
Excess deaths per 1000 people	0.005	0.005	0.005	0.004	0.005	0.005	0.004
	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
Average stringency index	-0.005	-0.004	-0.005	-0.005	-0.004	-0.005	-0.005
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6694	6683	6699	6694	6683	6699	6703

Notes: Standard Errors are in parenthesis, while asterisks denote significance levels, where * p < 0.1, ** p < 0.05, *** p < 0.01.

Appendix 6

Table 1.8: Reported number of cases per Capita and Survey-based percentage of positive cases

Country	By survey Proportion having a positive test themselves or knowing someone who does	ECDC data Total cases	ECDC data Cases per 1000
Germany	0.096	242,381	2.920
Sweden	0.239	84,233	8.234
Netherlands	0.178	70,071	4.055
Spain	0.154	462,858	9.861
Italy	0.116	268,218	4.444
France	0.140	277,943	4.148
Denmark	0.171	16,700	2.876
Greece	0.012	10,134	0.945
Switzerland	0.197	41,906	4.904
Belgium	0.223	85,442	7.459
Czech	0.032	24,367	2.288
Poland	0.039	66,870	1.761
Luxembourg	0.253	6,625	10.792
Hungary	0.021	5,961	0.610
Portugal	0.201	57,768	5.621
Slovenia	0.028	2,865	1.377
Estonia	0.045	2,373	1.791
Croatia	0.027	10,123	2.483
Lithuania	0.036	2,874	1.029
Bulgaria	0.026	16,190	2.313
Cyprus	0.043	1,487	1.698
Finland	0.031	8,077	1.464
Latvia	0.015	1,393	0.726
Malta	0.064	1,885	3.819
Romania	0.037	86,785	4.470
Slovakia	0.021	3,876	0.711
		Correlation	0.844

Notes: Proportion refers to the share of respondents who answered knowing (anyone) or being themselves COVID positive by means of a test, hence the largest circle in our analysis. ECDC data up to August 2020. Data on population is drawn from the World Bank Indicators.

Appendix 7: Results of the Mediation Analysis regressions for the income reduction variable

Table 1.9: Panel A: Summary of regression results of the three equations in the Mediation Analysis

Equation and Dependent Variable	**Type of Exposure, Coefficient of Exposure**						
	Self			**Household**			
	Symp	**Pos test**	**Hospita**	**Symp**	**Pos test**	**Hosp.**	**Death**
Eq [1]: Income reduction	0.054	0.084	0.455***	0.074***	-0.027	0.261***	0.236**
	(0.036)	(0.047)	(0.164)	(0.017)	(0.039)	(0.081)	(0.210)
Eq [2]:Income reduction	0.045	0.051	0.361***	0.061***	-0.024	0.181**	0.140**
	(0.037)	(0.045)	(0.184)	(0.017)	(0.040)	(0.078)	(0.136)
Eq [3]: Job Loss	0.026	0.090	0.253	0.035	0.009	0.218**	0.260
	(0.032)	(0.067)	(0.194)	(0.020)	(0.034)	(0.104)	(0.208)

Notes: Each cell contains the point estimate of the COVID exposure for different regressions. Equations [x] refers to the equation numbering in the Methods section. [2] is the full regression, including the mediator and all controls. [1] does not include the mediator. [3] refers to the regression of the mediator on all controls. Standard Errors are in parenthesis, while asterisks denote significance levels, where * p < 0.1, ** p < 0.05, *** p < 0.01.

Table 1.10: Panel B: Summary of the results on the mediation effect and different tests

Mediation Effect of Job Loss	**Type of Exposure**						
	Self			**Household**			
	Sympt.	**Positive**	**Hospital.**	**Sympt.**	**Positive**	**Hospit.**	**Died**
Proportion of total effect that is mediated	0.173	0.395	0.205	0.174	-.138	0.308	0.407
Mediation Tests (z-Values, significance given by stars)							
Sobel	0.788	1.336	1.300	1.575	0.239	2.091**	1.249
Aroian	0.787	1.336	1.299	1.573	0.238	2.089*	1.249
Goodman	0.789	1.336	1.301	1.577	0.239	2.093*	1.250

Notes: The first row of value indicates the portion of the relationship between COVID and financial strain that is explained through the Job Loss Channel, which is equivalent $\beta_1/\alpha_1 - 1$.The last three rows are the z-values of the test of hypothesis of the proportion, indicating whether it is significantly different from zero. Asterisks denote significance levels, where * p < 0.1, ** p < 0.05, *** p < 0.01.

Appendix 8: Results of the Logit Regression

Table 1.11: Panel A: Summary of regression results of the three equations in the Mediation Analysis

Equation and Dependent Variable	Type of Exposure, Coefficient of Exposure						
	Self			Household			
	Symp	Pos test	Hospita	Symp	Pos test	Hosp.	Death
Eq [1]: Income reduction	0.054	0.084	0.455***	0.074***	-0.027	0.261***	0.236**
	(0.036)	(0.047)	(0.164)	(0.017)	(0.039)	(0.081)	(0.210)
Eq [2]:Income reduction	0.045	0.051	0.361***	0.061***	-0.024	0.181**	0.140**
	(0.037)	(0.045)	(0.184)	(0.017)	(0.040)	(0.078)	(0.136)
Eq [3]: Job Loss	0.026	0.090	0.253	0.035	0.009	0.218**	0.260
	(0.032)	(0.067)	(0.194)	(0.020)	(0.034)	(0.104)	(0.208)

Notes: Each cell contains the point estimate of the COVID exposure for different regressions. Equations [x] refers to the equation numbering in the Methods section. [2] is the full regression, including the mediator and all controls. [1] does not include the mediator. [3] refers to the regression of the mediator on all controls. Standard Errors are in parenthesis, while asterisks denote significance levels, where * p < 0.1, ** p < 0.05, *** p < 0.01.

Table 1.12: Panel B: Summary of the results on the mediation effect and different tests

Mediation Effect of Job Loss	Type of Exposure						
	Self			Household			
	Sympt.	Positive	Hospital.	Sympt.	Positive	Hospit.	Died
Proportion of total effect that is mediated	0.173	0.395	0.205	0.174	-.138	0.308	0.407
Mediation Tests (z-Values, significance given by stars)							
Sobel	0.788	1.336	1.300	1.575	0.239	2.091**	1.249
Aroian	0.787	1.336	1.299	1.573	0.238	2.089*	1.249
Goodman	0.789	1.336	1.301	1.577	0.239	2.093*	1.250

Notes: The first row of value indicates the portion of the relationship between COVID and financial strain that is explained through the Job Loss Channel, which is equivalent $\beta_1/\alpha_1 - 1$.The last three rows are the z-values of the test of hypothesis of the proportion, indicating whether it is significantly different from zero. Asterisks denote significance levels, where * p < 0.1, ** p < 0.05, *** p < 0.01.

Appendix 9: Results of the Mediation Analysis regressions for the Meeting Ends variables, excluding Austria

Table 1.13: Panel A: Summary of regression results of the three equations in the Mediation Analysis

Equation and Dependent Variable	Type of Exposure, Coefficient of Exposure						
	Self			Household			
	Symp	Pos test	Hospita	Symp	Pos test	Hosp.	Death
Eq [1]: Ends meet	0.080***	0.053	0.140	0.052***	0.035	0.166**	0.417**
	(0.028)	(0.048)	(0.162)	(0.017)	(0.028)	(0.083)	(0.203)
Eq [2]:Ends meet	0.077***	0.047	0.119	0.049***	0.035	0.146*	0.399**
	(0.028)	(0.046)	(0.155)	(0.017)	(0.028)	(0.080)	(0.212)
Eq [3]: Job Loss	0.032	0.059	0.207	0.033	0.008	0.200**	0.180
	(0.030)	(0.060)	(0.172)	(0.021)	(0.034)	(0.098)	(0.194)

Notes: Each cell contains the point estimate of the COVID exposure for different regressions. Equations [x] refers to the equation numbering in the Methods section. [2] is the full regression, including the mediator and all controls. [1] does not include the mediator. [3] refers to the regression of the mediator on all controls. Standard Errors are in parenthesis, while asterisks denote significance levels, where * p < 0.1, ** p < 0.05, *** p < 0.01.

Table 1.14: Panel B: Summary of the results on the mediation effect and different tests

Mediation Effect of Job Loss	Type of Exposure						
	Self			Household			
	Sympt.	Positive	Hospital.	Sympt.	Positive	Hospit.	Died
Proportion of total effect that is mediated 0.040	.109	0.148	0.063	0.022	0.120	0.043	
Mediation Tests (z-Values, significance given by stars)							
Sobel	1.055	0.974	1.190	1.583	0.231	1.982**	0.919
Aroian	1.047	0.966	1. 180	1.571	0.229	1.967**	0.911
Goodman	1.065	0. 982	1. 199	1.596	0.233	1.998**	0.926

Notes: The first row of value indicates the portion of the relationship between COVID and financial strain that is explained through the Job Loss Channel, which is equivalent $\beta_1/\alpha_1 - 1$.The last three rows are the z-values of the test of hypothesis of the proportion, indicating whether it is significantly different from zero. Asterisks denote significance levels, where * p < 0.1, ** p < 0.05, *** p < 0.01.

Chapter 2

Food insecurity as a Powerful trigger of Migration Intentions

Abstract

There are concerns regarding the lingering effects of the COVID pandemic. For example, poverty and economic distress have remained higher than pre-pandemic levels in many countries, to the point that it has been associated with the unprecedented increase in migration flows to the United States, as measured by government agencies (CBP) and by migration intentions. The link between economic distress and migration, especially in the context of shock-led Food Insecurity (FI) and Poverty, is underexplored in current research. Our study aims to address this gap by examining the relationship between FI and migration intentions following a major, widespread shock (COVID). Here, we use the World Bank's High Frequency Phone Surveys (HFPS) to understand this link. We use data from 5 high migration Latin American countries, for a total of 5,300 observations. Our results indicate that households experiencing higher levels of FI are more likely to express a desire to migrate. Specifically, severe FI is linked to an average of 11.9 percentage point increase in migration intentions (CI 95%: 6.9 - 16.9). Additionally, we find a positive relation of migration intention increase and more educated individuals, raising concerns about the consequences of potential brain drain. Our research highlights the lingering impact of COVID-induced hunger on migration intentions, shedding light on the evolving nature of migration patterns in the face of new crises like inflation and climate change.

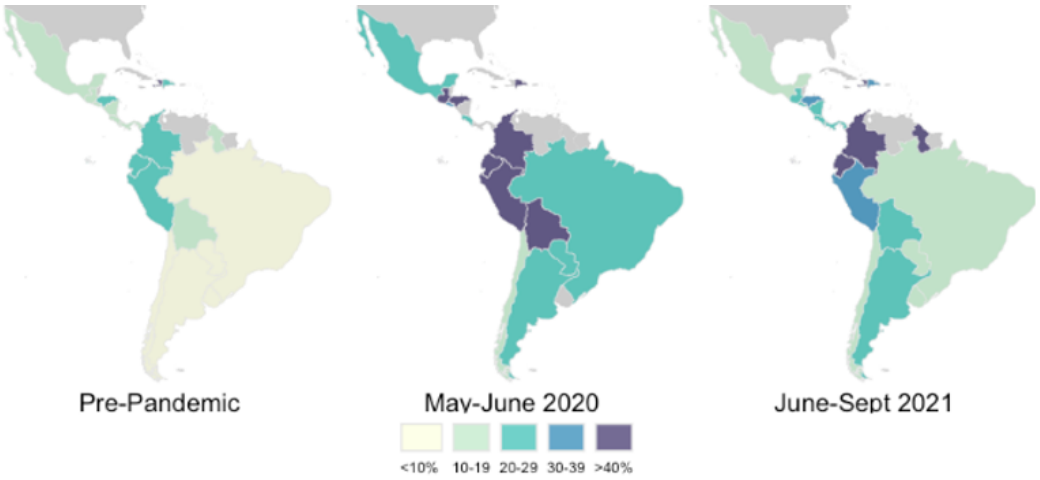
2.1 Introduction

The COVID-19 pandemic sparked an enormous amount of debate concerning its effects on the economy and on households. Although the World Health Organization has declared that COVID-19 *is no longer a global health emergency* (World Health Organization, 2023), significant dialogues persist regarding the pandemic's lingering effects and the way forward. Poverty and Food insecurity are amongst the main drivers of outward migration in the developing world (FAO, 2018; Obi, Bartolini, & D'Haese, 2020). In fact, several international actors have called for specific research about this link in the context of COVID. (Orjuela-Grimm et al., 2022; Smith & Wesselbaum, 2020).

Latin America and the Caribbean (LAC) was severely affected, with food insecurity (FI) skyrocketing to almost 32% at the height of the pandemic, from a previous 17% pre-pandemic and staying at 24% at the end of 2021. Figure 1 presents an overview of the different countries in the region and how have their FI evolved over the two first years of the pandemic. At the same time, 38% of Latin Americans in 2021 declare intentions to migrate, up from 28% in 2018. This desire has partly crystallized in actual migration, with the number of encounters in the US southern border experiencing a 27% increase between 2021 and 2022, and an 86% increase in the Panama-Colombia border (Customs and Border Protection, 2023; International Organization for Migration., 2023).

Research on the migration-FI link argues that individuals migrate as a coping strategy for households grappling with food insecurity, serving as a conduit for risk diversification (Hoddinott, 1994; Smith & Floro, 2020). In this sense, the migration decision is done when households optimize their future consumption, considering both the cost of migration and their immediate needs (W. A. Clark & Lisowski, 2019; De Jong & Gardner, 2014). This framework, which is part of the New Economic theory of Labor Migration as defined by Stark and Bloom (1985); Stark and Lucas (1988), has been helpful to lead empirical work. For example, Smith and Floro conclude that migration intentions increase with FI, and that this relation is monotonic on the level of FI. That is, more severe FI is linked to a stronger desire to migrate. Smith and Wesselbaum (2022) explore the results of migration

Figure 2.1: Food Insecurity in Latin America pre and during the COVID-19 Pandemic



Notes: Percentage of Households declaring having ran out of food in the previous 30 davs due to lack of money.
Source: Own calculations using the World Bank HFPS waves 1 and 2.
Brazil does not have information for May-June 2020 so data from AmericasBarometer is used.

flows and FI, using countries as unit of analysis. Their results show that migration is partly driven by food insecurity. However, they argue that food insecurity *inequality* also increases migration, since individuals might feel an additional pressure if they see themselves as being very FI with respect to their peers.

But, how do intentions correlate with preparations and realization of migration? This has been, in fact, studied profusely in the literature, and we highlight two important conclusions from these studies: First, there is evidence of a positive correlation of migration intentions (and preparations) and actual migration at the country level. For example, Tjaden, Auer, and Laczko (2019) find that, between two countries, a 1 per cent increase in emigration plans resulted in an increase in migration flows of 0.75 per cent. Second, this relation is moderated by specific push and pull factors. For example, a strong predictor of migration flows is the size of the network of previous migrants and the average income per person at destination, both of which are pull factors (Bertoli & Ruyssen, 2018; Docquier, Peri, & Ruyssen, 2014; Nikolova, 2023). However, push factors are also very relevant, with both wealth and education having an effect on the migration aspirations. Wealth is generally associated with a negative desire to migrate, while education goes in the opposite

direction (Carling & Collins, 2020; Clemens, 2020).

Although Food Insecurity is intrinsically related to wealth, the conditions during the pandemic provide a case in which there was a disentanglement between both, motivated by massive disruptions in the supply chain, layoffs and other unanticipated effects. We recognize a notable gap in the existing literature pertaining to shocks, as many studies have addressed food insecurity as a static issue, failing to account for detrimental alterations over time (Lindstrom, Randell, & Belachew, 2022; Sadiddin, Cattaneo, Cirillo, & Miller, 2019). Hence, this study contributes to the literature on migration-food security nexus by showing how FI influences migration decisions during hardships. Additionally, our database encompasses a selection of countries that significantly contribute to migration to the United States and whose economies are substantially reliant on remittances.

2.2 Background

Our focus in this paper is on five countries: Guatemala, El Salvador, Honduras, Nicaragua, and the Dominican Republic. The countries share similarities in terms of history, language and culture; but at the same time exhibit enough heterogeneity to contribute to the external validity and robustness of the results. The first four countries are neighbors in Central America and have a recent social and economic background. In fact, after their independence, they were part of a same sovereign state - the Federal Republic of Central America. And as of now, the four countries have a treaty that allows free movement of people between their borders. The DR is located in the Caribbean and has had a diverging recent history, becoming an important touristic destination and boasting the highest levels of national income of the five countries.

All countries are classified as Middle-Income; however, Nicaragua and Honduras, with a GDP per capita of 2.6 and 3.3 thousand respectively, are considered Lower Middle-Income, while Guatemala, El Salvador, and the Dominican Republic fall into the Upper Middle-Income category (See Table 2.1). Despite the differences in national income, these countries exhibit significant reliance on remittances, with figures ranging from one tenth

to a quarter of the GDP. In LAC, they occupy the highest ranking of remittances as percentage of GDP, besides Haiti. In fact, migration has historically played a crucial role in shaping economic and social structures in these countries, with remittances serving as a vital financial support mechanism.

Migration flow statistics indicate that a large percentage of the population has emigrated. For example, El Salvador had an emigrant stock of about 1.8 million based on OIM sources, which would equate to 28% of the population currently living in the country. These figures are systematic across the board, with the lowest being Guatemala at 9%. These differences could be tracked by several push and pull factors, for example, the TPS status of Salvadorian, which facilitated migration and regularization in the US. The Dominican Republic differs somewhat from the Central American nations, as it has been both a sender and a receiver of migrants, particularly with a significant Haitian labor presence. But still having one sixth of its current population as emigrants. (Knomad, 2020, 2022)

Table 2.1: Economic and Migration Data for the selected countries

Variables	Guatemala	El Salv.	Honduras	Nicaragua	Dom. Rep.
GDP per capita (USD)	5,739	5,550	3,285	2,599	11,825
Population (millions)	16.9	6.5	9.9	6.6	11.9
% of GDP from Remittan.	19%	24%	26%	26%	9%
Poverty rate ($3.65)	26%	8%	27%	14%	4%
Food Ins. 2017-19	45.2	42.2	40.9	NA	52.6
Food Ins. 2021-23	59.8	46.9	56	NA	46.1
Emigrant stock (OIM)	1.5	1.8	1.4	0.9	1.9
Emigrant stock (%)	9%	28%	14%	14%	16%

Notes: GDP, Population and Poverty rates are for the last available year from WDI. Food Insecurity data from FAO. Emigrant stock percentage is the Emigrant Stock divided by the population.

Despite variations in migration and economic indicators, these nations face common challenges such as poverty, inequality, crime, and food insecurity. While the poverty rate at the $3.65 threshold is lowest in the Dominican Republic at 4%, it is relatively higher in Honduras and Guatemala, where a bit more than a quarter of the population lives in poverty. Food Insecurity, as described by the FAO, remains high and follows the classification laid out by the poverty figures, with the DR and El Salvador having a FI rate of

about 46%, and Guatemala and Honduras reaching over half of their population. Critically, Food Insecurity pre-Pandemic was lower for all countries, except the DR, indicating a significant challenge in lowering hunger in the past few years.

These nations are also among the most significant contributors to migration into the United States. Between 70 to 90% of the migrants in the region choose the US as destination, with Nicaragua being the only exception, with 40% [1]. Data from the US in 2019 indicates this trends: among Hispanics, all five countries represent the largest share of undocumented migrants, along with Mexicans and Venezuelans (Millet & Pavilon, 2022).

2.3 Data

2.3.1 COVID-19 High Frequency Phone Surveys

The data used to carry out our analysis comes from the 2020-2021 High Frequency Phone Surveys (HFPS) by the World Bank (2022) and partners. At the start of the pandemic, the team launched an unprecedented data collection effort using phone surveys to track the effects of COVID-19 and inform policy makers. The resulting surveys include more than 400 rounds in more than 100 countries. Besides social and economic conditions, they include information on agricultural data, wealth, and income, impacts of shocks/crises, government assistance, and labor. Specialized rosters were included to study remittances and migration, vaccination, COVID related knowledge, amongst others.

The surveys done in Latin America and the Caribbean (LAC) were mostly harmonized at deployment, giving researchers an extra advantage when doing work that included several countries. We focus the efforts of this paper in this region, since we want to use pool data for several countries, and given that economic, labor and social conditions in LAC are generally comparable. In total, 5 waves were done during the 2020-2021 periods. Three were done immediately after the pandemic, during *Phase 1.* Two more were done during 2021, during *Phase 2.* The dates of deployment in each country are detailed in

[1] Nicaraguans traditionally migrated to Costa Rica, but most recent numbers indicate a shift to the United States

Figure 2.2.[2]

Hence, we use the 2nd wave of the 2nd phase. As presented in the previous secton, we restricted our analysis to 5 countries: Guatemala, El Salvador, Honduras, Nicaragua, and Dominican Republic. We therefore have a total of 5,565 observations for the 5 nationally representative surveys. Furthermore, after dropping observations with missing information, we end up with a workable sample of 5,302 observations. A table with the means of the main variables is provided below (Table 1).

Dependent Variable: Migration intentions

The migration roster first asks if the individual has any desire to migrate in the following 3 years – termed as *Intention to migrate*. This is a yes/no question that we operationalize as 1 in case of a yes. It then asks if this desire has increased (or reduced/stayed the same) due to the COVID-19 pandemic. We consider this *Increased Desire of Migration* as a 1 if the respondent declared that their intention has increased. This means that the base level for the latter are individuals who either report no desire to migrate, or, who had same or decreased intentions to migrate.

Utilizing both *Desire to migrate* and *Increased Desire to Migrate* separately as dependent variables offers an advantage that allows us to go beyond existing research: we can analyze the degree of correlation of current and past (structural) conditions with the dependent variable [3]. For example, we can explore how heightened FI is associated with these intentions, and its relative change. But at the same time, we can see how sociodemographics can act as mediators or moderators in this relation.

Main independent variable: Food Insecurity

Food insecurity (FI) in households in the survey is measured through a set of 3 questions relating to food availability and quality, plus a fourth one about past FI experience. The timeframe refers to the previous month, which is lower than the most used surveys like Latinobarometro (12 months), LAPOP (12 or 3 months), or the Gallup World Poll

[2]Although the survey can be used as a panel between Wave 1 and Wave 2, there were issues with the attrition rate being too high (between 31% to 64% by country).

[3]We only came across a single survey that asks a similar question, the Arab Youth Survey of 2020. Carling and Mjelva (2021) offer an extensive compendium of all surveys that inquire about migration intentions, preparation and motivations.

FIES module (12 months). These questions are: (1) Skipping a meal because of lack of resources - asked at the time of the interview and retrospectively before the pandemic; (2) Going without food for a day because of lack of resources; (3) Not eating healthy food because of lack of resources.

For the regressions, we operationalize these questions in two dichotomous variables: *Severe Food Insecurity* as 1 if individuals reports having all three FI insecurity conditions; and Moderate Food Insecurity if individuals report either *Not eating healthy*(Number 3 in the options above) or *Skipping a meal* (1). Hence, severe FI is a sufficient condition to be Moderately FI, but not a necessary one. Although these levels are based on FAO recommendations, they are not strictly the same (Cafiero, Viviani, & Nord, 2018). This is because the FI Experience Scale (FIES) uses more questions and applies an statistical adjustment to make the scale comparable at global level (Ballard, Kepple, & Cafiero, 2014; Nord, Cafiero, & Viviani, 2016).

Given that we possess data on both present and past (recalled) levels of Food Insecurity (FI), we can utilize them to discern the impact of current versus structural food insecurity. It is important, however, to acknowledge that the recall variable might be itself biased by current experiences. In fact, these are present even in current FI, with longer recall periods having more biases (Tadesse, Abate, & Zewdie, 2020; Villacis, Badruddoza, Mishra, & Mayorga, 2023).

Other Variables – Controls

Demographics: We include an array of demographic variables (gender, age, marital status, urban); and education variables (Primary, Secondary and Tertiary). The choice of variables follows the intuition of the positive relation of demographic variables on the dependent variable, which has been tested profusely in the consulted bibliography [4].

Wealth Index: In order to capture household wealth in the absence of direct income or expenditure data, we construct a country-specific Wealth Index using Principal Component Analysis (PCA), following established methodologies (Filmer & Pritchett, 2001; Vyas

[4]Aslany, Carling, Mjelva, and Sommerfelt (2021) provide a comprehensive systematic review on the motivations behind migration aspirations. Synthesizing much of the literature and the commonly used controls.

& Kumaranayake, 2006). The Wealth Index is derived from indicators of asset ownership and living conditions, namely: access to a dishwasher, a PC or tablet, internet or Wi-Fi, a motorcycle, as well as measures of household infrastructure such as access to appropriate potable water and overcrowding (defined as more than two adult equivalents per room). PCA assigns weights based on the variance and covariance structure of the included assets (factors), thereby providing a single measure of an underlying measure (wealth) (Rutstein & Johnson, 2004). Each country is constructed separately to guarantee comparability, allowing for variation in the types of assets that best reflect socio-economic status across different contexts (Howe, Hargreaves, & Huttly, 2008) [5].

Coping: The survey asks a myriad of question on government and private help during and pre-pandemic, we include a summarization of them, operationalized as *Government Help during the pandemic* being 1 if *any* help is received (see Molina Millán, Macours, Maluccio, & Tejerina, 2019). We also include the variable *Using savings or avoid paying debts* as a control, since it might also be a moderating factor in the decision to migrate. Finally, we include *Remittances during the pandemic*, since this is both a coping factor, but also influences the decision to migrate, through a revealed network.

Chores: Additionally, we include a variable for *Chores*, which indicates if the person has increased the time spent in household chores. This is because several studies have found a systematic change during the pandemic in the way households allocate their time, and this could change migration intentions (Borah Hazarika & Das, 2021; Enciso-Alfaro, Marhroub, Martínez-Córdoba, & García-Sánchez, 2024). We hypothesize that increasing chores has a positive effect in the desire to migrate. Nobles and McKelvey (2015) conclude that Mexican households where women had more decision-making and control over resources demonstrated lower migration rates. Increased chores might be an indication of lower intra-household heterogeneity, which might lead to lower female

[5] We perform the calculation using the `pca` command in Stata. To gauge the level of correlation and the internal validity of the factors, we compute *Cronbach's Alpha* and *Kaiser-Meyer-Olkin Measure of Sampling Adequacy* (Azevedo, 2006; Cureton & D'Agostino, 2013). Depending on the country, both are relatively high, between .58 and .68 for the Alpha; .70 and .77 for the KMO. This is indicative that the individual items measure a common underlying factor. The only caveat is for the DR, which has lower values (Alpha =.32 and KMO = .54). Robustness checks running the model without the DR are presented further on.

empowerment, and thus a higher migration desire. In fact, about 25% of respondents declare using more time on household chores, however, this differs by gender, with women being overwhelmingly more prone to have increased the time spent on household chores.

Table 2.2: Means table

	All Sample	GTM	SLV	HND	NIC	DOM
Migration Intention						
Migration intention	0.39	0.33	0.34	0.46	0.34	0.46
Migration intention up since pandemic	0.20	0.15	0.16	0.28	0.18	0.23
Food Insecurity - FI *						
Severe FI	0.07	0.03	0.03	0.11	0.06	0.13
Moderate FI	0.35	0.25	0.27	0.47	0.34	0.46
FI Pre-Pandemic	0.20	0.13	0.18	0.30	0.18	0.24
Transitions FI *						
Always FI	0.12	0.07	0.09	0.18	0.9	0.16
Never FI	0.65	0.76	0.72	0.54	0.69	0.56
From FI to non FI	0.08	0.06	0.09	0.12	0.09	0.08
From non-FI to FI	0.14	0.11	0.09	0.16	0.12	0.20
Demographics						
Married	0.58	0.57	0.58	0.60	0.61	0.55
Age	38.15	36.90	40.77	36.56	37.20	39.74
Woman	0.52	0.51	0.51	0.57	0.48	0.54
Urban area	0.62	0.60	0.62	0.55	0.65	0.68
Municipal Migration Rate **	0.10	0.05	0.11	0.16	0.11	0.10
Up to Primary	0.47	0.46	0.50	0.48	0.41	0.51
Secondary Ed.	0.40	0.44	0.31	0.43	0.39	0.39
Tertiary Ed.	0.13	0.10	0.19	0.09	0.20	0.11
Household Finances						
Wealth Index ***	0.02	0.03	0.01	0.05	0.01	0.00
Income down	0.29	0.26	0.25	0.28	0.30	0.35
Difficulty Making Ends	0.51	0.44	0.52	0.56	0.52	0.56
Remittances before the pandemic	0.22	0.11	0.22	0.27	0.27	0.28
Gender and Chores						
Increased time on household chores	0.25	0.24	0.20	0.25	0.24	0.30
Chores time up x women	0.15	0.15	0.12	0.16	0.13	0.17
Coping						
Any kind of Gov Help	0.40	0.32	0.81	0.29	0.18	0.47
Remittances during the pandemic	0.25	0.14	0.25	0.30	0.26	0.32
Coping: Savings using or didn't pay debts	0.62	0.53	0.56	0.70	0.60	0.74
N	5264	791	1466	922	842	1243

Notes: Means calculated without weights. * Food insecurity is Severe if the person reports not being able to eat for a whole day in the past month, or if they have more than 3 food insecurity conditions. Moderate Food insecurity indicates either non-nutritious diet or not being to afford at least a meal, but not for a whole day. The pre-pandemic question is asked retroactively. ** The municipal Migration rate is done at the municipal level using census data, except for Honduras, for which there were some compatibility issues and household survey data is used. *** The Wealth Index is a country-specific Principal Component analysis index of ownership or access to dishwasher, PC/Tablet, internet or WIFI, motorcycle; appropriate potable water at home and overcrowding (more than 2 adults equivalent per room).

2.3.2 Additional Survey Data

Census Based Data: Current research on migration indicate a strong influence of the *migration network* in both current migration and the reception of remittances (Acosta, Calderón, Fajnzylber, & López, 2006; Adams & Cuecuecha, 2010; Mora-Rivera & Van Gameren, 2021). Hence, we include census data for municipal migration rates. We use official sites from the NSOs (via REDATAM) as well as IPUMS (Minnesota Population Center, 2020)). Table 2.2 provides a view of the level of merging. Most countries allow for merging at the Municipality level (equivalent to a third level geographical area), while due to data limitations, data for the Dominican Republic can only be merged at the province level. This leads to about 32 to 246 unique municipalities/provinces merged, for surveys that on average have 1,000 observations per country.

Table 2.3: Migration rate using Census data (by regions)

Country	Level	Year	Total Regions	Mean	SD	Max	Min
Guatemala	Municipality	2018	246	5.2%	0.044	37.1%	0.4%
El Salvador	Municipality	2007	154	10.7%	0.054	40.2%	2.7%
Honduras	Municipality	2013	196	4.9%	0.024	21.9%	0.2%
Nicaragua	Municipality	2005	122	10.4%	0.042	21.5%	0.8%
Dominican Republic	Province	2010	32	9.5%	0.017	14.0%	4.3%

Notes: Data comes from Census Data for Guatemala, Honduras and Nicaragua using the REDATAM web interface. Data for other countries is taken from IPUMS harmonized census sample databases. Level indicates the level at which data is merged from Census to Survey. Total regions are the total unique regions at the level of merging. Statistics are calculated using the weights.

LAPOP and Latinobarometro: We use data from AmericasBarometer and Latinobarometo to test the robustness of our results [6]

2.4 Methods

To analyze the relationship between food insecurity and migration desires among households, we employed a linear probability model following the graphic scheme in Figure 2.2. Under this model, which is adapted from Alam and Mahal (2014); Carling (2017), illness

[6]Source: The AmericasBarometer by the LAPOP Lab, www.vanderbilt.edu/lapop and Latinobarometro Corporation, https://www.latinobarometro.org/lat.jsp

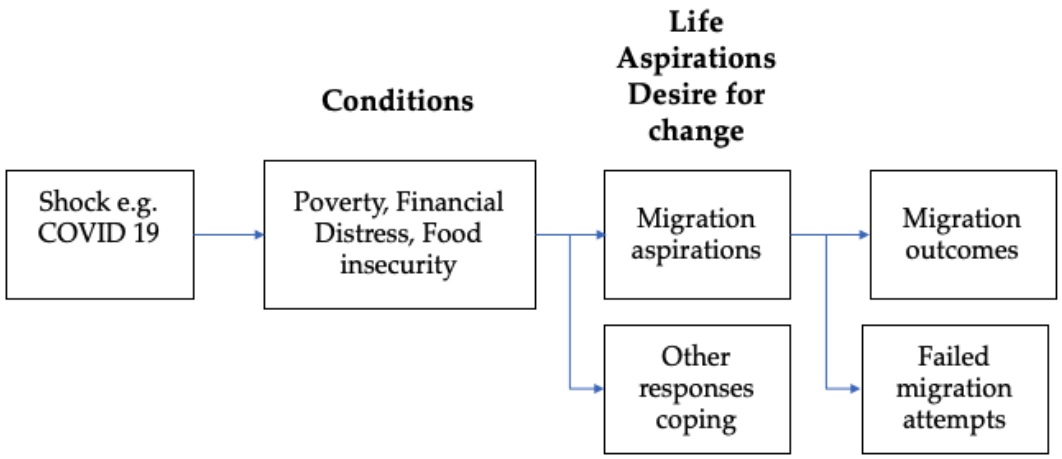


Figure 2.2: Graphical Representation of the shock and Migration. Adapted from Carling (2017) and Alam and Mahal (2014)

and lockdown lead to both direct and indirect costs. These manifest in conditions such as poverty, financial distress or food insecurity. Of course, these conditions might be transitory or they might be resolved with other coping strategies. However, we consider that a condition remains pervasive if the individual declares being in such condition. Individuals then confront their current conditions with their life aspirations and the future prospective leading to migration aspirations. [7]

The model can be expressed as:

$$\text{MigrateInt}_{\ i} = \beta_0 + \beta_1\ \text{FoodInsecurity}_{\ i} + \beta_2\ \text{BaselineFoodInsecurity} + \beta_4 X_i + \Psi + \epsilon_i \quad (2.1)$$

where $MigrateInt_i$ is a binary variable indicating whether household expressed a desire to migrate, or its increase. The coefficient β_1 represents the effect of current food insecurity. While β_2 indicates the effect of past FI. Xi is a vector of control variables for household which include socioeconomic status, household finances, and other relevant factors. We include state fixed effects (Ψ) to control for common factors at country level.

[7] Carling (2017) argues that indivuals are more motivated by a feeling of inescapable stagnation, than of simple destitution

2.5 Results

Summary statistics are reported in Table 3.1. About 7% of respondents declare Severe FI, while 35% declare moderate FI. At the same time, about 1 in every 5 respondents declared being food insecure before the pandemic (through the retrospective question). These values are country-dependent, with Honduras and the Dominican Republic suffering from more heavy Food Insecurity. Additionally, we highlight the transition of households: About 12% declare being Food Insecure both before and in 2021, while about two thirds declare not being Food Insecure in both periods. The pre- versus during pandemic transition from not being FI to being FI is about 14%, while on the opposite direction is 8%, indicating a net increase of more than 6 p.p. of those who are Food Insecure by the time of the survey.

As for migration intention, about 40% of them indicate a desire to migrate, of those, 48% indicate an increase during the pandemic, for a total of 20% of all sample having *increased migration feelings*. A priori, the countries most affected by FIES are also the ones with a higher migration desire.

The average age of respondents is around 38 years, with a fairly balanced gender distribution. The majority of respondents are married, live in urban areas, and have received up to primary education. Post-stratification weights balance these variables to the population averages, however we use the unweighted data for all the analyses.

In terms of economic variables, a significant proportion of respondents, around 29%, report a decrease in income, and more than half, about 51%, find it difficult to make ends meet, emphasizing the financial strain experienced by the respondents during the pandemic.

Furthermore, the table sheds light on coping mechanisms adopted by respondents, with 40% receiving some form of government help and 25% receiving remittances during the pandemic. A substantial 62% of respondents are either using savings or are unable to pay debts as a coping strategy, indicating the financial distress experienced by many.

Table 2.4: Regression results (Linear Probability Model

Dependent Variable	(1) Migration intention	(2) Migration intention up since pandemic	(3) Migration intention	(4) Migration intention up since pandemic
Food Insecurity - FI				
Severe FI			0.119***	0.055**
			(0.025)	(0.021)
Moderate FI	0.091***	0.052***		
	(0.016)	(0.013)		
FI Pre-Pandemic	0.033+	-0.021	0.046**	-0.012
	(0.017)	(0.014)	(0.017)	(0.014)
Demographics				
Married	-0.087***	-0.012	-0.087***	-0.012
	(0.013)	(0.011)	(0.013)	(0.011)
Age	-0.006***	-0.004***	-0.006***	-0.003***
	(0.000)	(0.000)	(0.000)	(0.000)
Woman	-0.125***	-0.039**	-0.122***	-0.037**
	(0.015)	(0.012)	(0.015)	(0.012)
Urban area	0.016	0.014	0.015	0.013
	(0.015)	(0.012)	(0.015)	(0.012)
Municipal Migration Rate	0.513*	0.241	0.522*	0.247
	(0.243)	(0.201)	(0.244)	(0.202)
Secondary Ed.	0.003	0.055***	0.000	0.053***
	(0.015)	(0.012)	(0.015)	(0.012)
Tertiary Ed.	0.004	0.101***	-0.002	0.097***
	(0.022)	(0.018)	(0.022)	(0.018)
Household Finances				
Wealth Index	-0.010+	0.004	-0.013*	0.003
	(0.005)	(0.004)	(0.005)	(0.004)
Income down	0.047**	0.059***	0.053***	0.063***
	(0.015)	(0.012)	(0.015)	(0.012)
Difficulty Making Ends	0.047***	0.066***	0.056***	0.072***
	(0.014)	(0.012)	(0.014)	(0.011)
Remittances pre-pandemic	0.047*	0.029+	0.048*	0.030+
	(0.020)	(0.016)	(0.020)	(0.016)
Gender and Chores				
Increased time on chores	-0.006	0.131***	-0.005	0.132***
	(0.022)	(0.019)	(0.022)	(0.019)
Chores time up and women	0.021	-0.050*	0.022	-0.050*
	(0.029)	(0.024)	(0.030)	(0.024)
Coping				
Any kind of Gov. Help	-0.007	-0.023+	-0.005	-0.021+
	(0.014)	(0.012)	(0.014)	(0.012)
Remittances during the pandemic	0.087***	0.056***	0.087***	0.057***
	(0.019)	(0.016)	(0.019)	(0.016)
Coping: Savings/Debts	0.131***	0.110***	0.139***	0.116***
	(0.014)	(0.012)	(0.014)	(0.012)
Observations	5264	5303	5264	5303

Notes: Robust standard errors in parenthesis. Significance levels: + p <0.1, * p <0.05, ** p < 0.01,*** p < 0.001. Each column reports results from a different regression, where the dependent variable is "Migration Intention" or "Increase in Migration Intention due to the pandemic". Omitted reference group for Education is Primary Education. Country fixed effects included.

2.5.1 Regression results

A selected version of the regressions is presented in Table 2.4. Overall, our results are broadly consistent with the existing literature on migration in developing regions. Specif-

ically, we find that households that experience higher levels of food insecurity are more likely to express a desire to migrate, even after controlling for other demographic and economic factors. We focus on Severe FI (column 3), as results from Moderate FI are similar in direction but smaller in absolute numbers. For households who were food insecure before the pandemic, the model predicts a 4.6 percentage point increase in the probability of wanting to emigrate compared to individuals who were not food insecure, all else being equal. The coefficient for current FI (Food insecurity during the pandemic) is 0.119. This is also significant, indicating a stronger association between food insecurity during the pandemic and the desire to emigrate compared to pre-pandemic food insecurity. For individuals who are food insecure during the pandemic, the model predicts an associated 11.9 percentage point increase in the probability of wanting to emigrate compared to individuals who are not food insecure.

The model using *Migration intention up since pandemic* reveals that the coefficient for FI Pre-Pandemic is -0.0112, but it is not significant. This implies that pre-pandemic food insecurity does not have a statistically significant association with the change in the desire to emigrate since the pandemic. For individuals who are food insecure during the pandemic, the model predicts a 5.48 percentage point increase in the probability of the desire to emigrate having increased since the pandemic compared to individuals who are not food insecure, all else being equal.

The contrast between the results of the two models suggests that the desire to emigrate is more strongly influenced by current circumstances (*food insecurity during the pandemic*) rather than past circumstances (*food insecurity before the pandemic*).

Now, considering the effect of the controls in the Dependent variable, we notice that Increased migration desires are highly correlated with education, chores, and income variables. For example, having tertiary education increases the probability of increased migration intentions by 10 p.p. over the baseline of primary or lower. In the case of chores, the increase is 13 p.p. in general, and given the coefficient on womenxchores, this would indicate a 8 p.p. increase for women (.13-.5). This goes along the lines of empowerment

hypothesis by Nobles and McKelvey (2015).

2.6 Robustness Checks

We perform several robustness checks to stablish the robustness of the results. They are summarized in Table 2.5 and explained in the following subsections:

Table 2.5: Summary of the Robustness Checks

Robustness Check	FI Variable	Mig. Intention	Higher Intention
Baseline	Severe	0.119***	0.055**
		(0.025)	(0.021)
	Moderate	0.091***	0.052***
		(0.016)	(0.013)
Ex DR	Severe	0.143***	0.050+
	(N=3983)	(0.033)	(0.027)
	Moderate	0.100***	0.052***
	(N=4021)	(0.018)	(0.015)
Modified FI Variable	Whole Day	0.890***	0.0548***
		(0.016)	(0.014)
	Once	0.066***	0.0484**
		(0.019)	(0.016)
Encompassing Model	Severe	0.0868***	0.0324
		(0.026)	(0.016)
	Moderate	0.0757***	0.045***
		(0.016)	(0.014)

Notes: Robust standard errors in parenthesis. Significance levels: + p <0.1, * p <0.05, ** p < 0.01,*** p < 0.001. Each row reports results from a different regression, where the dependent variable is marked by columns 3 and 4: "Migration Intention" or "Increase in Migration Intention due to the pandemic", except for the Encompassing model. Cells indicate the coefficient of interest. Ex DR includes the sample size.

2.6.1 Exclusion of the Dominican Republic

We consider the exclusion of the Dominican Republic, as the country differs in several economic indicators compared to the others. We find that excluding the DR gives stronger results for the main independent variable in most cases, except for Higher Intention and severe FI, which becomes significant only at the 10% level. This might be due to the lower sample size.

2.6.2 Variables check

We perform the main regression (Eq. 2.1), using modified versions of the Food Insecurity variable. First, we consider Moderate FI to exclude *Eating healthy*, that is, whether the individual skipped a meal at least once, or during the whole day. Second, we consider the FI variable the individual skipping a meal at least once, but not the whole day. This distinction is important because it allows us to compare the variable with its retrospective counterpart, as both of them are ask about the same thing but in different periods. Additionally, we restrict the baseline for this model to everyone, except those who skipped meals during the whole day. This is because we do not want the worse-off individuals to be part of the comparison group. The results for both checks are very similar to our main regression, indicating the robustness of the results and the comparability of the variables of present versus past FI.

2.6.3 Encompassing Model

We run the regression with both the severe and the moderate food insecurity variables. Results point to the same direction as with the single variable model. The only exception is Higher Intention and Severe FI, which is no longer significant. This might be because Moderate Food insecurity in the same regression captures the effect of Severe FI as well.

2.7 Discussion

2.7.1 Current versus past Food Insecurity Experiences

Taken together, these results suggest that the current circumstances (food insecurity during the pandemic) have a greater impact on both the desire to emigrate and the increase in the desire to emigrate than the past circumstances (food insecurity before the pandemic). The overall desire to emigrate appears to be influenced by both past and current food insecurity, but more so by current food insecurity. The increase in the desire to emigrate follows the current food insecurity.

This might indicate that people's emigration desires are more responsive to their current situation rather than past experiences. So, even if someone experienced food insecurity before the pandemic, their decision to emigrate or their changing desire to emigrate is more strongly influenced by whether they are currently experiencing food insecurity. This could be because the current situation is more salient or because it's more indicative of their future prospects.

For many individuals, and given the unequal effects of Food Insecurity (Smith & Wesselbaum, 2020), the urgency and immediacy of current FI might overshadow past experiences, making the present conditions a more powerful motivator for emigration. During the pandemic, many individuals faced unprecedented disruptions in their livelihoods, leading to acute food insecurity that heightened the urgency to seek better opportunities abroad.

2.7.2 Human Capital Loss & Realization of Migration

The reality of increased migration of educated individuals could develop into a loss of Human Capital. Research indicates that wealthier are less inclined towards migration, but highly educated individuals are more likely to materialize the migration after they desiring to Clemens (2020).

The shift in migration intentions among more educated individuals observed in our regressions highlights the pandemic's broad impact on global mobility trends. Despite the fact that these individuals are very unlikely to experience Food Insecurity, the increased desire to migrate among them may be driven by several factors. For example, there is evidence that migration intentions could be triggered by shared experiences of FI, meaning that individuals that were not traditionally Food Insecure consider migrating because of the worsening palpable situation of their peers and their context (Smith & Wesselbaum, 2022).

If on one hand the more educated sectors of the population are increasingly considering to migrate, and, in the other, those with higher education follow through their plans, this could cause long-term ramifications on the economic and social development of their home

nations, and potentially widen existing inequalities.

In fact, brain drain can have profound impacts on the countries of origin. The loss of educated and skilled individuals can lead to a shortage of professionals in critical sectors such as healthcare, education, and technology. This can hinder the country's ability to innovate, provide essential services, and improve its overall economic competitiveness. Moreover, the migration of the wealthy and educated can weaken social capital, as these individuals often play key roles in community leadership and development.

Furthermore, the economic contributions of migrants through remittances, while significant, may not fully compensate for the loss of human capital.[8] While remittances can provide much-needed financial support to families back home, they do not replace the skills and expertise that the migrants take with them. This can create a paradox where the immediate financial benefits of migration are offset by long-term developmental challenges.

2.8 Conclusion and Policy Recommendations

The impact of COVID-19 on food insecurity in the LAC region has been significant, and it appears that the repercussions may extend beyond just the immediate crisis. Overall, these results point to a common variable of human nature: faced with better life prospects, human mobility is expected. This observation underscores the importance of considering both the intention and the capability to migrate, as well as the socio-economic conditions that may facilitate or hinder the actualization of such intentions, especially in countries that are major contributors to migration flows. The increased migration from these countries to the United States post-pandemic highlights the critical interplay between food insecurity, economic conditions, and migration patterns, warranting further exploration and understanding of the multifaceted factors influencing migration decisions.

In fact, although we shed light on the increase of migration intentions, the liaison between migration intention and actual migration is more complicated. Unfortunately,

[8] More information on Soler-Lopez (forthcoming)

we are not able to look at actual migration; however, middle class and more educated groups tend to be more likely to act on intentions (due to resources) as compared with lower educated and more deprived groups. In addition to economic conditions, other factors such as political stability, security, and environmental conditions also play crucial roles in shaping migration patterns. For instance, political instability or violence in home countries can serve as significant push factors, prompting individuals to seek safety and stability abroad. Environmental factors, such as natural disasters and climate change, can also exacerbate food insecurity and force individuals to migrate.

Beyond push factors at origin, pull factors at destinations are of extreme importance. Wage gaps, economic opportunities, migration networks and families at destinations are just a few of them. But, circumstantial issues are also relevant. For example, the recent ramp up of border and immigration controls have resulted in lower encounters at the Southern border of the USA.

The reduction in migration flows follows a stick strategy which is not geared towards addressing the root causes of migration in the region. Food Insecurity might be even increasing with the current de-funding of international aid. In fact, the results of this paper also call for increased support by international aid agencies. For example, food assistance programs are particularly important in the region, given how prone local agriculture is to natural disasters and seasonalities Programme (2017). Moreover, programs like Regreso Sefuro (USAID and Internal Rescue Committee) guarantee that returned migrants can re-start their lives in a productive way.

Therefore, a comprehensive approach to understanding migration must consider the interplay of these various factors. Policymakers need to address the root causes of migration by improving economic conditions, enhancing food security, and promoting political stability in countries of origin. International cooperation and targeted interventions are essential to manage migration flows effectively and to ensure that migration is a choice rather than a necessity driven by dire circumstances.

Chapter 3

Naturalization and Voting Behavior as a Response to Discrimination. Evidence from Immigrants in the U.S.

With Ireri Hernandez Carvallo

Abstract

This paper explores the effect of discrimination and perceived threat on the naturalization and voting behavior of first-generation U.S. immigrants. Applying a difference-in-differences framework, we use the 2016 presidential candidacy and election of Donald Trump and his explicit targeted attacks towards particular groups of immigrants during his campaign, presidency, and the COVID-19 pandemic, to study the effects on the naturalization and voting patterns of the targeted groups relative to non-targeted groups. We find positive and significant effects (26% increase in naturalizations) for Mexicans relative to other non-targeted immigrant groups and relative to other non-Mexican Latinos[1]. In contrast, Chinese-born individuals reduce their naturalizations after the aggressive anti-Asian COVID-19 rhetoric. Additionally, we find an increase of 6 and 9 percent in the reported voting turnout of naturalized Mexicans and Asians in the 2016 and 2020 presidential election, respectively.

[1]While *Latinx/Latine* is a more inclusive term, we use *Latino* to refer to all persons of Latin American origin or descent. This is done to avoid confusions as only a small percentage of Latinos identify or know the gender-neutral term; and to follow the approach of recent literature, as well as surveys and census questions. See https://www.pewresearch.org/short-reads/2023/09/05/who-is-hispanic/

3.1 Introduction

How do immigrants respond to political attacks directed against them? Does their political behavior change as a response? Anti-immigrant sentiment, specifically on the basis of race, religion, or ethnicity, has been an element of populist nationalist discourse widely used as a political tool to rally supporters. Of relevance in these settings is how those targeted react politically. Do they increase their civic engagement in an attempt to protect themselves and push back, or do they retreat towards lower political participation in an attempt to minimize their salience? Do attacks affect only explicitly targeted groups, or do they spillover to closely linked immigrant groups?

Immigrants are a rapidly growing segment of the population in many countries. How immigrants cope under hostile settings is of special interest, as discrimination may be a barrier to their successful integration and has been documented to be related to their mental and physical health (Jasinskaja-Lahti, Liebkind, Jaakkola, & Reuter, 2006; Pascoe & Smart Richman, 2009; Schmitt, Branscombe, Postmes, & Garcia, 2014; Szaflarski & Bauldry, 2019), housing opportunities (Ahmed & Hammarstedt, 2008; Bosch, Carnero, & Farre, 2010), labor market outcomes, economic performance (Carlsson, 2010; Dancygier & Laitin, 2014; Zschirnt & Ruedin, 2016), and violent encounters with natives and the state (Dancygier & Laitin, 2014). Discrimination is also likely be related to immigrants' political and civic integration and engagement, particularly in settings where they face both societal (interpersonal) and political discrimination, in which the latter "typically refers to discriminatory laws, campaign messages, policies, or practices carried out by state or private institutions and/or their affiliated actors" (Oskooii, 2016, p.616). Empirical work studying the relationship between discrimination and civic engagement of ethnic groups or immigrants has found that both alienation and a rise in political engagement are potential reactions (Chan, Nguy, & Masuoka, 2024; DeSipio, 2002; Oskooii, 2016; Sanchez, 2006; Schildkraut, 2005). While shedding light on the conditions that might increase or decrease political participation, most of these studies focus their attention to the behaviors of broader pan-ethnic groups and include several immigrant generations, with only a few

studies that particularly explore the experience of first generation immigrants (Chan et al., 2024; Masuoka, 2006). Furthermore, most report relationships using data from interviews, surveys, and self-reported measures of discrimination and political engagement, with very few estimating causal relationships.

This analysis contributes to the existing literature in several ways. First, while racial, ethnic, and religious discrimination can affect several generations of immigrants and non-immigrants, our focus here is on the behavior of foreign-born naturalized U.S. citizens (first-generation immigrants), whose behavior may differ from second and further removed immigrant generations and has been studied less closely. In the U.S., first-generation immigrants compose a non-trivial part of the population and political electorate. In 2020, first-generation naturalized citizens made up 10% of U.S. eligible voters (Budiman, Noe-Bustamante, & Lopez, 2020). Furthermore, in 2019, there were 9.2 million first-generation lawful permanent residents that were potentially eligible for naturalization (Baker, 2019). Anti-immigrant rhetoric and political agendas that highlight the salience of particular immigrant groups are likely to change the civic and political behavior of targeted immigrant groups. Indeed, Pantoja, Ramirez, and Segura (2001) report that Latino immigrants that naturalized during a politically hostile climate in California had a higher probability of voting. Relative group discrimination in Latino communities has also been associated with a higher propensity to vote for the Democratic Party in 2016 (Berry, Cepuran, & Garcia-Rios, 2022). Moreover, the rise in COVID-19-linked discrimination towards Asians seems to be consequential to the unprecedented increase in their vote turnover and in the probability of voting democratic during the 2020 elections (Chan, Kim, & Leung, 2022). This analysis further sheds light on this issue by focusing on naturalization and voting turnout separately for more recent threats that were felt at a national level and is related to the recent worldwide rise in anti-immigrant rhetoric in the backdrop of populism and globalization.

We build on the extensive work of Fouka on immigrant integration (Fouka, 2019), contributing to the literature by focusing on more recent groups of immigrants and addi-

tionally examine voting turnout and potential spillover effects among immigrant groups. We use a quasi-experimental design that uses the supply of anti-immigrant rhetoric and policies that focused on particular groups, allowing us to test how the effects of targeted anti-immigrant rhetoric may differ according to nationality of birth. Our second contribution to the literature is on political cleavages and in-out group formation by drawing a closer look at responses by nationality of origin, which goes beyond the usual treatment of broad pan-ethnic groups as a single political units.

Specifically, we analyze the question of whether individuals that belong to an immigrant group that is politically targeted in anti-immigration rhetoric increase their likelihood of naturalizing and voting. To shed light on this, we use variation in discrimination targeting under the candidacy and presidency of Donald Trump, which was heavily anti-Latino and anti-Mexican during his campaign and first years of presidency; evolving into a more nuanced but visible anti-Muslim rhetoric and finally, with the arrival of the global pandemic in 2020, the focus shifted towards anti-Asian and anti-China rhetoric. We explore how these targeted groups respond politically, as measured by their yearly naturalization patterns and presidential election voting turnout behavior. We employ several iterations of the difference-in-differences framework by comparing the behaviors of immigrant groups directly targeted and those not explicitly targeted before and after 2016 and 2020. We make use of administrative naturalization counts by country of origin and Current Population Survey voting turnout data to measure the behavioral responses. We find that relative to non-targeted groups, naturalization of Mexican-origin and Asian nationals increased during Trump's presidency, but Chinese-born decreased their naturalization after 2020, coinciding with the massive COVID related rhetoric. We find that both groups reacted by increasing their voting turnout behavior in the 2016 and 2020 presidential election, respectively. Furthermore, our results show that the effects did not spill over to non-Mexican Latinos, a closely linked immigrant group. Finally, we observe no significant changes in behavior for nationals of countries affected by Trump's travel ban.

3.2 Discrimination, Group Threat, and Political Behavior of Immigrants: Review of the Literature

The study of group identity and behavior under salience and bias has deep roots in social psychology. Social identity and self-categorization theory (Tajfel, Turner, Austin, & Worchel, 1979; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987) state that when social cleavages become salient, individuals categorize themselves into an in- or out-group, and that threat to a group's worth triggers protective reactions from its members, varying in level with the strength of identification. Taking this a step further, the Rejection-Identification Model (Branscombe, Schmitt, & Harvey, 1999) suggests that under discrimination, members of the out-group maintain psychological well-being by increasing their identity with the out-group and rejecting the negative evaluations of the in-group. Identity can become salient and politically relevant when politicians deliberately supply hate-creating stories against out-groups (Glaeser, 2002). Previous work suggests that anti-immigrant rhetoric and settings increase the salience of ethnic identity within immigrant groups (Armenta & Hunt, 2009; Jiménez, 2010; Rumbaut, 2008).

The literature on discrimination distinguishes between individual discrimination and group discrimination (Oskooii, 2016). In the case of individual discrimination the relationship with political engagement is likely to be mitigated by the strength of identity with the out-group, as social identity theory predicts (Schildkraut, 2005). In contrast, reactions to group level-discrimination are likely to depend on an individual's strength of identification with the group and politicization of the group's identity (Pérez, 2015a, 2015b).

In addition to group politicization, the level of the perceived group threat, which can be triggered by immigration legislation or immigration enforcement actions, is likely to influence the level of the response of individuals. Under highly politicized climate, particularly under the threat of California's 1994 proposition 187[2] which was perceived to be anti-immigrant, Latinos naturalized under this environment voted at substantially higher

[2]California's 1994 proposition 187 was a ballot initiative to prohibit non-U.S. citizens from using public services such as health care services and public school education.

rates than Latinos naturalized in other times and states, and at higher rates than U.S. born Latinos (Pantoja et al., 2001). Additionally, for immigrant groups with large numbers of undocumented or deportable citizens, threat can also take the form of immigration arrests and deportation, which have been documented to increase voter turnout of eligible group members (White, 2016).

While anti-immigrant legislative threats are likely to affect a wide range of immigrant groups, politicization and salience (or lack thereof) of particular groups (because of their size or composition), has been shown to generate heterogeneity in reactions among groups. The H.R.4437 bill[3] passed by the U.S. House of Representatives in December of 2005 triggered group threat and was a catalyst for the 2006 immigration reform protests that strongly mobilized Latinos and other immigrant groups with large undocumented populations (Barreto, Manzano, Ramírez, & Rim, 2009; Zepeda-Millán, 2014, 2017). However, among non-Latino immigrant groups, mobilization against this bill was mixed. Zepeda-Millán (2014) finds that "several non-Latino immigrant groups failed to mobilize to the same extent because many of them (often mistakenly) did not feel as threatened by the proposed nativist bill", mainly because of how illegal immigration was racialized and framed by the media as a Mexican problem. Barreto et al. (2009) find that while Latinos in general mobilized, Mexican-Americans and those that spoke Spanish at home were more likely to participate in protests in response to the H.R. 4437 bill. This is likely because they identified more with the group being targeted (undocumented immigrants) and due to the politicization of Mexican identity in particular.

Similarly, while Latinos are often portrayed as one cultural and political block, their national origin identity is distinct and there is likely to be heterogeneity in responses to discrimination depending on which particular identities become salient, as different political rhetoric is likely to create different group cleavages. Garcia-Rios, Pedraza, and Wilcox-Archuleta (2019) test this given the specificity of Trump's rhetoric which made

[3]This bill called for stricter border enforcement and made it a felony to live undocumented in the U.S. (instead of a misdemeanor), called for the federal government to take custody of undocumented immigrants detained by local authorities, and required stricter verification of workers' legal status by their employer, among other provisions.

national origin identity of Mexicans salient, and find evidence that while other strong-identifying Latinos also viewed Trump unfavorably and were less likely to report voting for him, it was not to the same extent as those of Mexican heritage, suggesting that the recent rhetoric more strongly politicized and made national origin more salient for Mexican-Americans. In order to study the factors that affect the response by non-Mexican origin Latinos Gutierrez, Ocampo, Barreto, and Segura (2019) study how pan-ethnic Latino identity is related to perceptions of Trump. They report that Latinos that share an immigrant-linked fate and those that felt that Latinos are racialized were more likely to feel angry during the 2016 election. Furthermore, they find that those made angry by Trump's remarks were more likely to report being engaged in political activities during and shortly after the 2016 election, including U.S. born Latinos and non-Mexican Latinos who report feeling similarly targeted. However, they still find some heterogeneity in views towards Trump by national origin (e.g. Cubans and Central Americans held a more positive view of Trump relative to Mexicans) and immigrant generation.

Other literature highlights the role of other emotions and factors in the relationship between group discrimination and political action, highlighting that threat can be particularly demobilizing when accompanied with fear and cynicism but mobilizing when in the presence of messages of hope (Valentino, Brader, Groenendyk, Gregorowicz, & Hutchings, 2011), and that anger is likely to increase political participation but fear and anxiety do not necessarily have the same effect (Valentino et al., 2011).

Studies focused on the U.S. Muslim community find that while discrimination increases group identity and the interest to engage politically, it decreases the likelihood of political engagement in the months following 9/11 (Takyar, 2019). The potential explanation for this is that an increase in-group identity might not be sufficient, and what might be needed "is strong ethnic identification in the context of societal encouragement, or at least acceptance, of multiculturalism", and that relative group size and fear could also play a role in how the Muslim community in the U.S. reacted (Takyar, 2019). Studying how feelings mediate the response, Ayers and Hofstetter (2008) found that feelings of anxi-

ety following 9/11 were positively associated with reported political participation. More generally, Oskooii (2016) relates individual societal discrimination with decreased engagement (although the literature suggests this depends on the level identity with the group) and political (group) discrimination with increased political activism (again, contingent on politicization and other factors) and finds that Muslims report being more politically active in response to political discrimination.

While there are reasons to believe and some survey-based studies suggest that strong-identifying Latinos that felt targeted by Trump may report changing their political behaviors due to perceived threats (Garcia-Rios et al., 2019; Gutierrez et al., 2019), there is yet no evidence of this in terms of naturalization behaviors and voter turnout of first-generation immigrants, a group that is particularly likely to feel targeted and whose political integration under discrimination is of particular interest in the study of their political integration. Furthermore, the evidence suggests that while Latino and immigrant identity may be important when triggered, in the case of Trump's rhetoric, there seems to be heterogeneity in responses by generation and nationality, and thus it is not clear ex-ante that the naturalization and voting behaviors of non-Mexican Latino immigrants will change as a response. Finally, while the majority of the literature focuses on Latinos and Asians, this study looks at the political behavior or nationals that were targeted by Trump's travel ban, seeking to add to the knowledge other behaviors of migrant groups that may identify as Muslim.

3.3 Background

Throughout history, immigrant and racial minority groups in the U.S. have been negatively portrayed in the information environment and classified as out groups. Within the current immigration debate, this particularly the case for Arabs and Muslims (Kalkan, Layman, & Uslaner, 2009; Lajevardi & Oskooii, 2018; Oskooii, 2016), Latinos (Abrajano & Hajnal, 2017; Valentino, Brader, & Jardina, 2013), Asians, and other non-white immigrant groups (Abrajano & Hajnal, 2017). While immigration has historically been a

highly divisive topic in the political agenda, there was a shift to more explicit openly targeted and prejudiced remarks beginning with the 2016 presidential campaign, which were met with controversy and decried as explicitly racist. Trump infamously began his political campaign by declaring that "When Mexico sends its people, they're not sending their best ....They're bringing drugs. They're bringing crime. They're rapists. And some, we assume, are good people. ... It's coming from more than Mexico. It's coming from all over South and Latin America, and it's coming probably – probably – from the Middle East" (Trump, 2015). In December of 2015, his campaign called for a "total and complete shutdown of Muslims entering the United States"[4]. The rhetoric in place under presidential candidacy and election of Donald Trump has been documented to create a sharp worsening of anti-immigrant sentiment and actions at the societal level as well (Bursztyn, Egorov, & Fiorin, 2017; Crandall, Miller, & White, 2018; Newman, Shah, & Collingwood, 2018), triggering both social and political discrimination and threat.

On the week of January 23th, 2017, shortly after his inauguration, Trump signed 3 executive orders related to immigration restriction and enforcement. Executive order 13769 prohibited individuals from predominantly Muslim countries from entering the United States for 90 days, suspended entry into the country from Syrian refugees, and prohibited other refugees from coming into the country for 120 days. While this particular version of the law was blocked by a judge, a new version (Executive order 13780), which was upheld by the Supreme court, replaced it and places limits on travel to the U.S. by nationals of several countries[5].

Two other orders focus on the detention of immigrants and the building of a wall between the U.S. and Mexico. Executive Order 13767 ordered increased border vigilance and included the construction of his key rallying point, a wall across the U.S.-Mexico bor-

[4] https://www.c-span.org/video/?c4737466/user-clip-trumps-muslim-ban

[5] The latest revision was in February 2020, and bans travel to the U.S. by nationals of North Korea and Syria; by nationals of Iran except on student or exchange visitor visas; by nationals of Libya and Yemen on immigrant, tourist or business visas; by nationals of Eritrea, Kyrgyzstan, Myanmar, Nigeria and Somalia on immigrant visas; by nationals of Sudan and Tanzania on diversity visas; and by some government officials of Venezuela on tourist or business visas. The order allows case-by-case exceptions under certain circumstances.https://www.whitehouse.gov/presidential-actions/proclamation-improving-enhanced-vetting-capabilities-processes-detecting-attempted-entry/

der, which he had promised Mexico would pay for. Furthermore, Executive Order 13768 ordered a broader application of existing immigration laws for removal of immigrants, allowed local law enforcement to perform functions of immigration officers, and stated that sanctuary jurisdictions that refused to comply with immigration enforcement measures would be denied federal funding. This executive order re-established the Secure Communities program, a federal program administered by Immigration and Customs Enforcement (ICE) started under the Bush administration and suspended 2014.[6]. This program enables ICE to access information on immigrants detained in local jails, in which ICE may issue a detaining order to hold the individual until they can be picked up for immigration detention and deportation.

Immigration enforcement under Trump has created shifts in the types and locations of ICE arrests. Since there has been backlash to the Secure Communities Program and many regions choose not to actively participate, ICE has stated[7] that it then needs to increasingly rely on community arrests, in which they directly encounter individuals they believe are deportable in their communities (e.g. in their homes, workplaces, commutes, or elsewhere). This type of enforcement may lead to spillover encounters with citizens and permanent residents that have not committed any offense or are not deportable. During its operations in 2017, ICE encountered (the process of interview, screening, and determination of citizenship, which may or may not lead to an arrest) 27,540 U.S. citizens, compared to 5,980 in the last year of the Obama administration (Cantor, Ryo, & Humphrey, 2019). Those that ICE wrongfully encounters are likely to come from communities that have large number of undocumented or deportable permanent residents nationals. According to (Transactional Records Access Clearinghouse (TRAC), 2018) immigration data obtained from ICE about 60% of those arrested in FY2017 and FY2018 were Mexican nationals,

[6]The last years of immigration enforcement under Obama focused on arresting individuals with serious level criminal convictions and recent immigrants under the Priority Enforcement Program, but under Trump, this hierarchy of priority was removed, widening the type of offenses for which individuals were apprehended. The program has been credited as a very effective way of removing undocumented immigrants, but existing studies suggest that it did not have any effect on reduction of crime (Miles & Cox, 2014; Treyger, Chalfin, & Loeffler, 2014)

[7]https://www.ice.gov/news/releases/dhs-ice-announce-arrests-more-170-large-aliens-sanctuary-jurisdictions

with the second largest group (10.5%) from Guatemala, 8.3% from Honduras, and 6.4% from El Salvador. Given the shift of type and nature of arrests under the presidency of Donald Trump, we use variation in arrests by nationality across states and time as a potential variation of group threat.

Taken together, the travel ban and stronger border and immigration enforcement is likely to have triggered fear of travel for non-U.S. citizens, and could have increased the perceived value of becoming a U.S. citizen. This is likely to trigger the most group threat for the nationals which were explicitly targeted and made salient by Trump, particularly those coming from countries targeted by the travel ban and Mexicans, currently the largest group of U.S. immigrants. Additionally, other proposals under Trump included restricting birthright citizenship and threatening the Deferred Action for Childhood Arrivals program (which did not happen); others were enacted and include the cancellation of Temporary Protected Status for nationals of El Salvador, Nicaragua, Haiti, and Sudan (making them deportable) and a ruling that makes the use of public welfare services by non-resident immigrants a reason for future green card denial.[8]

For immigrants, citizenship through naturalization is a pre-requisite to vote. To be naturalized, an immigrant must fulfill certain requirements, such as: being a legal permanent resident; having continuously resided in the U.S. for a certain amount of time; ability to speak, read and write in English; knowledge of U.S. government and history; and being of good moral character. Factors that increase probability of embarking on the naturalization process include length of time living in the U.S., level of education, eligibility for dual citizenship, as well as local institutional contexts (Jones-Correa, 2001). It is also costly, since it involves filling out the application and paying fees[9], learning enough English to pass the written and verbal sections of the test, and passing a civics knowledge exam. While this cost may seem low relative to the benefits, for those that are likely to have lower levels of schooling, less time and monetary resources, this might be a significant

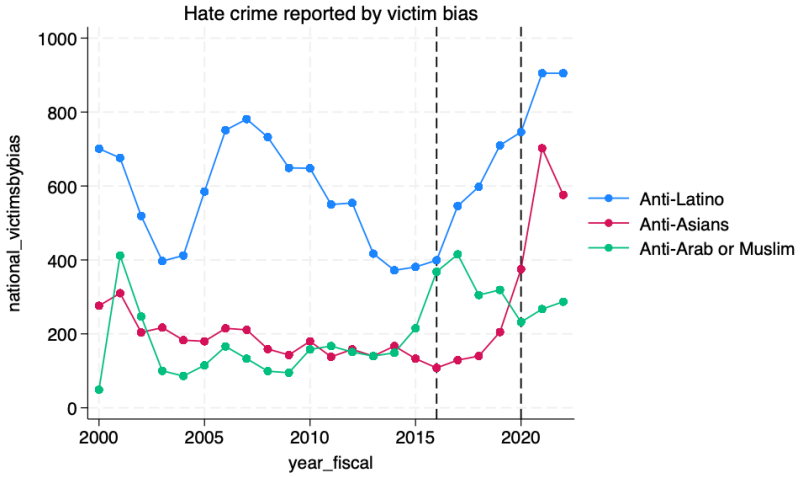
[8]For a full report of immigration-related policy changes in the first two years of the Trump administration, see Pierce (2019).

[9]In many cases, to reduce the bureaucratic burden and to avoid costly mistakes, this also involves hiring an immigration attorney, whose fees can be significant.

investment.

The narrative of discrimination has been mirrored in significant increases in hate crimes directed towards Asian and Latinos (See Figure 1 and R. Lu and Sheng (2020); Y. Lu, Kaushal, Huang, and Gaddis (2021). As, relative group discrimination could also motivate political participation (Berry et al., 2022), we expect a positive effect in voter turnover corresponding with the treatment highlights by race/ethnicity/year. In fact, recent literature has denoted that pan-Asian common identity has shifted the vote of Asians towards Biden during the 2020 Presidential election (Chan et al., 2022; R. Lu & Sheng, 2020), and Latino common relative discrimination did the same in the 2016 Elections (Berry et al., 2022).

Figure 3.1: Total Hate crimes reported by Victim bias



Notes: Data from Federal Bureau of Investigation (FBI) Uniform Crime Reporting (UCR) program. See Data section for further information

In this analysis, we will be studying the behaviors of 5 groups of foreign-born naturalized immigrants: 1) Mexicans, 2) Latin Americans (excluding Mexicans), 3) the group of those born in one of the 6 majority Muslim countries affected by Trump's travel ban, 4) A selected group of Asian countries [10], and, 5) Chinese. We analyze Mexicans and

[10] We follow Chan et al. (2024) to select these countries: China (PRC), Philippines,Vietnam, Japan, India and Korea (the Korean peninsula countries). Overall, the represent more than 80% of the naturalizations from Asia origin

other Latin Americans separately, since Trump has most explicitly targeted Mexicans and Mexico, and other Latin Americans may or may not feel threatened by his remarks and actions. Furthermore, after we establish that there was no effect on Latin Americans, we use this group as a control group for Mexicans.

3.4 Data Description and Sources

3.4.1 Naturalizations

We use naturalization data from the U.S. Department of Homeland Security compiled by the Office of Immigration Statistics on the number of persons naturalized by country of origin and state of residence for those 18 years and older who became naturalized in a given fiscal year[11]. Fiscal year of naturalization may be a lag of the year of application for naturalization because of processing times, which may vary from year to year. [12]

Naturalizations Profiles

Along with the naturalization data, the DHS offers a less granular aggregate of naturalization profiles. This data is by country of birth at the national level - in contrast to the Naturalizations data, which is by state-nationality. The data has information age, sex, marital status and occupation of the newly naturalized by year.

3.4.2 Hate Crime

We use hate crime data from the Federal Bureau of Investigation (FBI) Uniform Crime Reporting (UCR) program, which complies data on hate crime, particularly crimes that

[11]Fiscal years run from October 1st of the previous year to September 30th of the current year. Naturalizations data from: `https://www.dhs.gov/immigration-statistics/naturalizations` for years 2004-2023

[12]While the decision to naturalize may be one taken at the individual level, one's petition might be denied. At the level of observation carried out here we only observe the number of naturalization petitions that were approved successfully. That is, the observed naturalization numbers may be an equilibrium outcome that involves both more petitions but potential increases in denial rates and backlogs that may have slowed down the actual naturalization numbers. If this is the case, then the numbers observed might be attenuated, and the estimates will be a lower bound relative to the number of petitions for naturalization and in a setting with no backlogs and no increase in denial rates; this might not be a problem as long as this affects naturalization from all countries (particularly control and treatment groups) similarly.

manifest evidence of prejudice based on race, ethnicity, religion, sexual orientation, disability, gender, or gender identity[13]. The types of offenses that are collected as hate crime include: crimes against persons and crimes against property such as robbery, burglary, larceny-theft, motor vehicle theft, arson, and destruction/damage/vandalism. There are several weaknesses of this data, particularly that participation in the FBI UCR Program is mandated for federal law enforcement agencies, but is voluntary for local, state, and tribal law enforcement agencies, thus the number of hate crimes may be under-counting crimes that are not voluntarily reported by non-federal law enforcement agencies. Other critiques of using this data include that in many cases victims never report crimes to the police, many law enforcement agencies do a poor job of consistently collecting and categorizing hate crime data (Loftin & McDowall, 2010; Shanmugasundaram, 2018; Zaykowski, 2010). McVeigh, Welch, and Bjarnason (2003) report that hate crimes are more likely to be reported in counties with a legislative mandate for data collection, in counties with resourceful civil rights organizations, and in counties with more political party competition.[14] Furthermore, another large drawback from this data in this analysis is that there is no indication of whether a victim was an immigrant, and it includes hate crimes committed towards all members of a group, not just those that are foreign-born immigrants.

3.4.3 Voter Turnout Data

To study voter turnout of naturalized citizens we use the Current Population Survey November Voting and Registration Supplement from IPUMS (Flood, King, Rodgers, Ruggles, & Warren, 2020) pooling data from 2002-2020. Our sample consists of naturalized citizens. After each election, the CPS asks respondents whether they were registered to vote, and if registered, whether they voted. Starting in 1994, the CPS provides country of birth of respondents, and whether they are naturalized citizens. For the voting turnout data, we exclude those individuals that for the voting question responded anything other than yes/no (e.g. We don't know or declines to answer) and missing responses. As other

[13]Data from `https://crime-data-explorer.fr.cloud.gov/downloads-and-docs`.

[14]In a next step we can try to compare hate crime data with report from the U.S. Justice Department's Bureau of Justice Statistics, which estimates its numbers from its National Crime Victimization Survey.

survey data, these responses are subject to vote over-report non-response bias, though CPS results tend to have lower over-report bias compared to other surveys (McDonald, 2019).

We construct the group of *Mexico* by intersecting Latino/Hispanic origin with Mexico as country of birth, this is done to rule out Mexican-born individuals who might not be Hispanic, and thus might not be affected by the overt discrimination. For the other groups, we keep only the country of birth, since these groups might have more limited pan-ethnic identities (J. Y. Kim, 2020).

3.5 Empirical Strategy

We use a combination of Synthetic Differences-in-Differences (SDID) and repeated cross-section difference-in-differences (DID) strategies to estimate the impact of Trump's election on our outcomes of interest. We use the former for the naturalizations analysis as the major treated group (Mexicans, Asians and Latin Americans) are significantly larger than any of the other groups. Moreover, compared to traditional DID, SDID is at least as good in terms of consistency and statistical normality (Arkhangelsky, Athey, Hirshberg, Imbens, & Wager, 2021). For simplicity, we consider the following equation, which describes a traditional DID:

$$Y_{ijk} = \alpha_1 + \boldsymbol{\beta_1} Post_j * T_{ij} + \gamma_{1i} + \delta_{1j} + \lambda_{1k} + \epsilon_{1ij}$$

Y_{ijk} is the variable of interest, be it naturalizations or voter turn out, from birth country i in year j in state k. T_{ij} is a treatment indicator, equal to one for those affected countries or country groups (separately estimated for each group) interacted with $Post_j$ a dummy for the post 2016 period. γ_{1i} is a dummy for country of birth or group of treated countries of birth, and δ_{1j} is a post indicator for years 2016 onward (or a full set of year dummies in richer specifications). Furthermore, a region-specific dummy λ_{1k} (where k is state) is added.

For each potentially treated group, a separate regression is estimated omitting the other potentially treated groups. That is, we look at the effects on Mexicans, Latin Americans, Asians and Travel Ban countries separately, relative to other nationalities. The coefficients of interest are the set of βs.

The *Synthetic Differences-in-Differences* takes the comparison of the treated groups further: it re-weights control units to ensure a parallel trend with the treated pre-treatment trend. By doing so, it allows the parallel trend assumption to be relaxed, as the algorithm implicitly assigns the best 'match' in pre-treatment trends using a mix of the control units. The choice of this method specifically for the naturalization follows the reasoning presented in Figure 2. As noted, Mexicans, Asians and Latin-Americans are significantly larger than other countries, considering that there are more than 100 countries in the *Other* category. We considered a re-weighting to be a more adequate representation of the situation, even if results using traditional DID are robust to those using SDID (see Annex)

For the voting turnout analysis, a linear probability model is used, where the outcome is a dummy variable equal to one if naturalized individual h from birth country i reported voting in election year j. PT_{hij} is now the treatment indicator equal to the interaction of an individual being born in a targeted country and it being election year 2016 or 2020. As before, a regression is estimated separately using each potentially targeted group as the treatment group, omitting the other potentially targeted groups. Additionally, state of residence dummies are used as controls in some of the specifications.

$$Y_{hij} = \alpha_3 + \boldsymbol{\beta_3} PT_{hij} + \gamma_{3i} + \delta_{3j} + \lambda_{3k} + \epsilon_{3ij} \tag{3}$$

Using Latinos as a control group for Mexicans is a plausible strategy that we test a robustness check. In general, Latinos as a group take longer to naturalize, and naturalization rates among Latinos (except for Cubans) have tended to be the lowest and historically about half the naturalization rate of non-Latino immigrant groups (Pantoja &

Gershon, 2006). Furthermore, immigrants from Latin America are more likely to behave more like Mexican immigrants than any other group. Once we establish that there were no significant effects for non-Mexican Latinos, we therefore repeat the analysis for Mexican nationals using other Latinos as a control group.

3.6 Sample Description and Summary Figures

For the naturalization outcomes, we use yearly naturalization counts at the country of birth by state level for 2010-2022 as the unit of observation. We restrict the sample to 2010 onwards because of the peak in naturalizations during 2009, which was motivated by a change in the cost of the naturalization procedure. Additionally, we restrict the sample to observations that are present for all years studied (balanced panel). This means that we drop the naturalizations from countries that are not present for all the years, where there are non-zero non-reported values (these are mostly countries with few naturalizations and likely grouped into the group "other country" in non-reporting years). Additionally, we drop observations with withheld naturalization values (cells with less than 3 naturalizations are marked as withheld by the Department of Homeland Security).

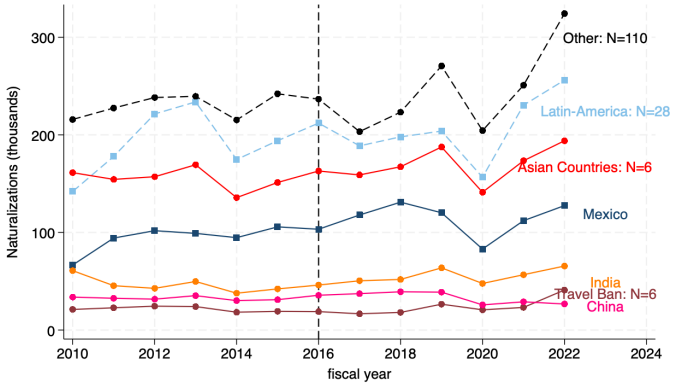
Figure 3.2 shows yearly total naturalization counts added across all states and group of interest. Note that all data are according to fiscal year, which runs from October 1 to September 30 of the given year. The first group (not in order of naturalizations) consists of those born in Mexico, the second group is made up of those born in other Latin-American countries (excluding Mexico). The third group includes those born in 6 majority-Muslim countries targeted by Trump's 2017 travel ban. The fourth group includes those born in China (PRC), Philippines, Vietnam, Japan, India and Korea. The fifth group all other countries not mentioned and serves at the initial control group.

As Figure 3.2 shows, those from Mexico account for a large share of the naturalizations. [15] There is an increase in Mexican nationalization requests after 2016, which is not seen

[15] Although not shown in the graph, naturalizations are thought to have spiked around 2008 as a response to an increase in naturalization fees on that were enacted in July of 2007 and as a result of campaigns prior to the 2008 presidential election (Blizzard & Batalova, 2019). Since there is a delay between application and

by other nationalities. During 2020, the number of naturalization dropped drastically, but recovered significantly for all nationalities in the past four years.

Figure 3.2: Total Naturalizations by Groups of Interest: Country-of-birth-State-Year Level, 2010-2023



Notes: Latin-America excludes Mexico and Puerto Rico (whose citizens are automatically U.S. citizens) and includes the following countries of birth: Argentina, Aruba, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Dominica, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay, Venezuela. Naturalizations of Muslim countries included in the 2017 were those of people born in the following countries: Iran, Libya, Somalia, Sudan, Syria, Yemen. Asian countries include: China (PRC), Philippines,Vietnam, Japan, India and Korea (the Korean peninsula countries). Other includes those naturalized citizens born in all other countries whose observations are balanced.

Table 3.1 shows pre- and post-2016 means of naturalizations across countries by group of interest. At the state-level there were on average 1,837 (2,316 & 2,109) yearly naturalizations of individuals born in Mexico in the pre (post 2016) period. The average yearly state-level number of naturalizations across non-treated countries was 41 (42 & 46) in the pre (post) period. In general, Mexico has a much larger level of average naturalizations than other countries.

naturalization time and sharp increases may create backlogs, many of the 2008 naturalizations correspond to petitions filed in 2007.

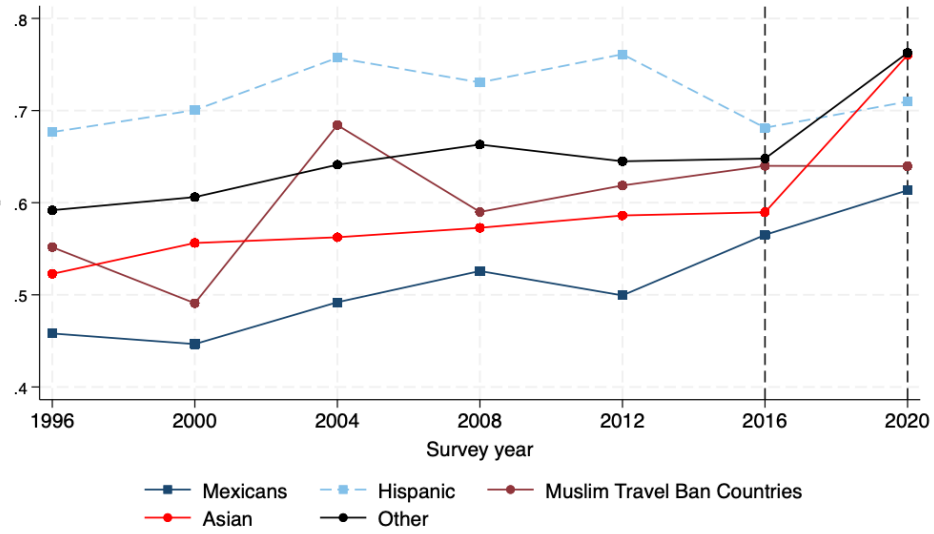
Table 3.1: State-wide Naturalizations by Grouped Country of Birth

Country	Years 2010-2015		Years 2016-2019		Years 2020-2023	
	Mean	Obs	Mean	Obs	Mean	Obs
Mexico	1,837	306	2,316	204	2,109	153
Latin America	133	8,568	141	5,712	150	4,284
Trump Travel Ban	71	1,836	66	1,224	93	918
Asia	506	1,836	553	1,224	554	918
Asia ex China	480	1,530	515	1,020	558	765
China	636	306	741	204	533	153
India	911	306	1,040	204	1,112	153
Other countries	41	33,660	42	22,440	46	16,830

Notes: Standard deviations in parenthesis. Observations at the country-of-birth state-year level. Samples consists of balanced panels. * See Figure 1 for the countries included.

Figure 3.3 shows Current Population Survey reported voting turnouts of U.S. naturalized citizens for presidential elections. Naturalized Mexican and Asian-born US citizens have in general lower reported turnouts than all other groups, although there is a sustained increased over time. The turnout for Mexican-identified seems to have risen more than other groups in 2016. However, the biggest increase in 2020 is seen for Asian-born.

Figure 3.3: Presidential Voting Turnout in CPS Sample by Groups of Interest



Notes: Sample consists of naturalized citizens. Mexicans and Hispanics are Self-Identified. Naturalized citizens of Muslim countries included in the 2017 Travel Ban were people born in the following countries: Iran, Libya, Somalia, Sudan, Syria, Yemen. Asian countries include: China (PRC), Philippines,Vietnam, Japan, India and Korea.

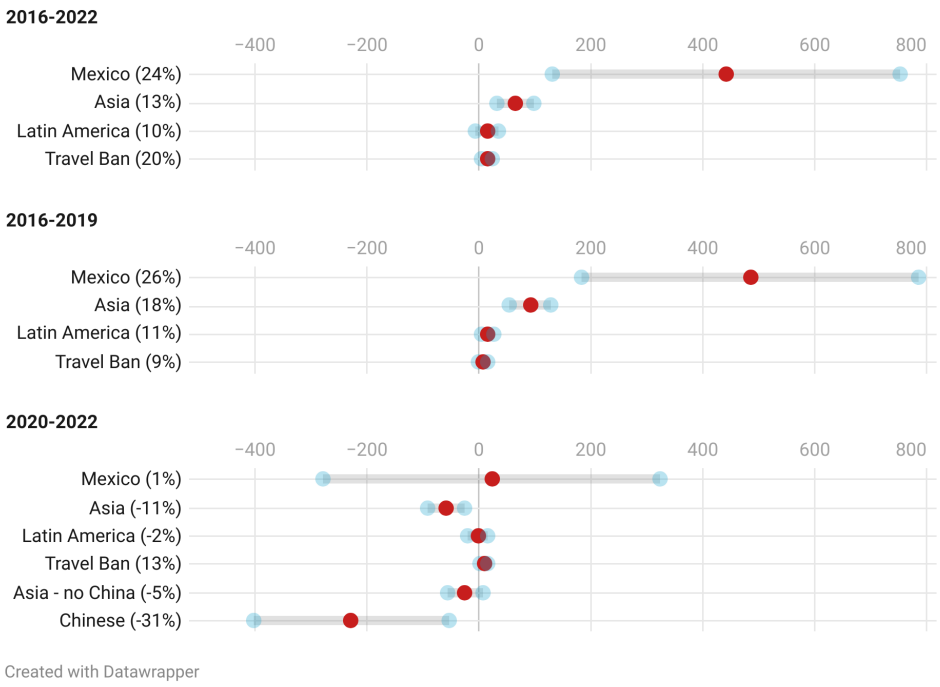
3.7 Naturalization Results

Figure 3.4 shows the results of the coefficient on the SDID Average Treatment Effect (ATT). We have organized the results to account for the different treatment periods, even if there could be some residuals from the beginning. In fact, we consider the first three rows to be the most significant, as they pool the effects of the overall discriminatory policies and rhetoric during the Trump presidency.

First, there is a consistent positive effect of the naturalization of those immigrants born in Mexico relative to those of other non-targeted countries (excluding the countries in the other potentially treated groups). The effect is positive and statistically significant for the 2016-2022 and 2016-2019 periods, but not as much for the 2020-2022. Although the results from the last row grouping (2020-2022) should be taken with care, since the control years include 2016-2022, which is debatable. Interestingly, for other Latin Americans, there is no effect in the grouped post period. Naturalizations also increase for the Asian during the whole period, even if it seems that sub-grouped periods are different. This is mainly driven by the unprecedented decrease of naturalizations of Chinese citizens in 2021 relative to 2019 [16]. In fact, we note a -31% decrease in Chinese naturalization during the 2020-2022, when compared to the previous years. As the other targeted groups, Travel Ban countries also experienced an increase in their naturalization levels, although the first period seems to be largely statistically insignificant. Between the groups, and compared to their baseline (pre-treatment years) levels, we find that the Mexico group is significantly higher than the other, with an increase of almost a quarter of the naturalizations (1 837 in 2010-2015, increasing by 440 in 2016-2022 - the ATT). This is followed by Travel Ban countries at 20% and Asians at 13%. The Latin American group indicates a 10% increase, although not signficant.

[16] This has been noted by other sources as well: https://www.pewresearch.org/short-read/2022/12/01/after-declining-early-in-the-covid-19-outbreak-immigrant-naturalizations-in-the-u-s-are-rising-again/

Figure 3.4: Average Treatment Effect (in levels) from the Synthetic DID using different treatment periods. Including percentage changes (in parethesis) from control period and 95% CIs



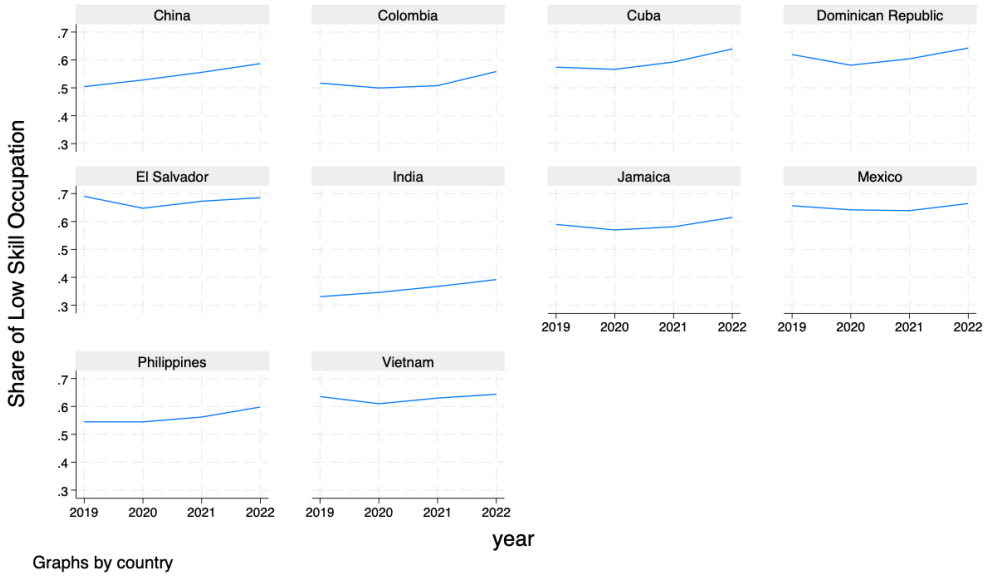
Notes: Results from the SDID using the Arkhangelsky et al. (2021) methodology. Each range represents a different treatment period, while all previous years are taken as controls. Percentage changes from baseline are in parenthesis. Control countries are all countries that are not part of the 4 presented groups. 95% intervals are calculated using boothstrapping from the `sdid` command in Stata.

3.7.1 A tale of two nationalities: China and Mexico

Why do naturalizations of Chinese-born individuals decrease so sharply (30%), while naturalizations of Mexican-born individuals increase by 25%? We argue that key differences between the two groups account for this change. First, Chinese-born individuals generally have higher education and occupations than other groups, giving them a premium that is valued in both host and home countries (see figure 3.5). Secondly, Chinese citizens must renounce their Chinese nationality to become US citizens, complicating future plans of returning to China.

In terms of utility maximization, both naturalization and discrimination are costly, but the cost of the latter rises in an environment with highly aggressive anti-immigrant

Figure 3.5: Data for top countries of Naturalizations - Share of Lower Skill



Notes: Own calculations using the DHS natualization profiles

rhetoric. Additionally, these costs depend on specific group and individual factors. Targeted individuals evaluate whether naturalization is worth to decrease the potential costs of discrimination. We can assume that anti-immigrant rhetoric increases uncertainty, which decreases the expected net present value of not naturalizing. For Mexicans, the cost of naturalization is lower than for Chinese, as Mexican nationals can keep their Mexican nationality. Moreover, the outside option is less valued for Mexicans, who are less skilled and might struggle in a labor market that is less advanced than that of the United States. This is not the case for Chinese nationals who return to China, where highly skilled individuals are in high demand.

To support this claim present the regression in Table 3.2. The table summarizes the regression of the TWFE using the *Naturalizations Profiles*. The unit of observation is Nationality at birth in a given year at the national level. We regress a binary variable (Low vs High Skill), against Treatment (e.g. China after 2020). Column 1 shows that Chinese-born naturalized citizens are becoming increasingly low-skilled with an increase

of 6.8 p.p. over the post-treatment years. The case is the opposite for Mexicans, with a decrease of almost 4p.p., and with no effect for the Travel ban group. Thus, faced with aggressive anti-immigrant rhetoric, the two groups act in different manners, since their initial conditions are greatly different.

Table 3.2: Regression of the Low Skill share on Treatment years (2020 for Chinese, 2016 for other groups)

	(1)	(2)	(3)
Dep.Var: Low Skilled	China	Mexico	Travel Ban
ATET			
Post	0.0682***	-0.0396***	-0.0583
	(0.00503)	(0.00581)	(0.0404)
Observations	1062	1026	1071

Notes: Columns using each country/group as a separate regression. * p < 0.10, ** p < 0.05, *** p <0.01. Each column represents a different country group using different treatment years 2020 for Chinese, 2016 for other groups), while all previous years are taken as controls.

3.8 Voting Turnout Results

In this section, we look at the results of a linear probability model of having voted for the sample of all naturalized citizens in the CPS. We find that there was a positive and statistically significant effect on the reported probability of voting of naturalized Mexicans in the 2016 and 2020 election and for Chinese-born citizens in the 2020 election, as can be seen in Tables 3.3 and A2. Each specification indicates a grouping of nationalities, as described in the data section of this paper. The coefficeint of 0.043 suggests an increase of about 4.3 percentage points in the voting turnout of Mexicans relative to those of other nationalities for the 2016 and 2020 election. Relative to the pre-post presidential election turnout of .49 for Mexicans, this is about a 8 percent increase. In contrast, Chinese citizens decrease their turnout in 2016 by -5.7 p.p., but greatly increase it in 2020 by 13 percentage points. Overall, Chinese citizens increase turnout by 3.7 p.p. over the two elections.

We find no consistent significant effect on the probability of having voted for naturalized citizens of Muslim countries targeted by Trump's travel ban (see Appendix Tables). We find a negative effect on the probability of voting in 2016/2020 for non-Mexican His-

panics, this is mostly driver by a sharp decrease in turnout in 2020.

Table 3.3: Linear Probability Model Coefficients on Effect on Reported Voting Turnout in both 2016 and 2020 Presidential Election.

	(1)	(2)	(3)	(4)	(5)
	Mexico	Hispanic	Travel Ban	Asian	China
Treatment	0.0429***	-0.0717***	-0.0107	0.0405	0.0372***
	(0.00954)	(0.0266)	(0.0273)	(0.0256)	(0.00936)
Group_Dummy	-0.136***	0.0321	-0.195***	-0.0808***	-0.297***
	(0.0469)	(0.0253)	(0.00823)	(0.0117)	(0.00250)
N. of observations	22841	19850	18819	25558	19442
year dummies	Yes	Yes	Yes	Yes	Yes

Notes: Each column is a different regression, using as treatment the country of birth of each group. Years of treatment are 2016 and 2020. Pre-years include election years 1996-2012. Observations at the individual-year level. Heteroskedasticity-robust standard errors clustered at the country of birth level. Sample is restricted to naturalized citizens that answered yes/no to having had voted (excludes non-responses and missings). Excludes Non-Mexican self-reported Hispanics and those born in Muslim countries affected by the 2017 travel ban. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3.4: Linear Probability Model Coefficients on Effect on Reported Voting Turnout in both 2016 and 2020 Presidential Election - Separated by Election year

	(1)	(2)	(3)	(4)	(5)
	Mexico	Hispanic	Travel Ban	Asian	China
Treatment Year=2016	0.0601***	-0.0473	0.0235	0.000455	-0.0572***
	(0.0103)	(0.0371)	(0.0391)	(0.0298)	(0.0105)
Treatment Year=2020	0.0236*	-0.0964***	-0.0485	0.0854***	0.134***
	(0.0129)	(0.0199)	(0.0301)	(0.0254)	(0.0121)
Group/Country	-0.136***	0.0332	-0.194***	-0.0814***	-0.297***
	(0.0471)	(0.0248)	(0.00839)	(0.0114)	(0.00251)
N. of observations	22841	19850	18819	25558	19442
Year dummies	Yes	Yes	Yes	Yes	Yes

Notes: Each column is a different regression, using as treatment the country of birth of each group. Years of treatment are separated are 2016 and 2020. Pre-years include election years 1996-2012. Observations at the individual-year level. Heteroskedasticity-robust standard errors clustered at the country of birth level. Sample is restricted to naturalized citizens that answered yes/no to having had voted (excludes non-responses and missings). Excludes Non-Mexican self-reported Hispanics and those born in Muslim countries affected by the 2017 travel ban. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

3.9 Robustness checks

We perform a series of robustness checks to control for possible mis-specifications. As noted, we experimented using different controls for the groups that we study in this paper, results did not vary greatly, indicating that the choice of the current controls is largely adequate. Additionally, we perform several other checks:

3.9.1 Using different Methodologies for the DID

The `sdid` command allows us to run a simple DID, which we do for the main results. We first compare the graphic results (presented in the Appendix A3 and A4) and notice how the SDID results are, conveniently, weighted to create the pre-trends. This is by construction. We compared these results with the normal DID (graphs are also in the Appendix). Additionally, we compiled the results into a table (see below), and highlight how results are statistically the same.

Table 3.5: Comparison of the results using DID and SDID

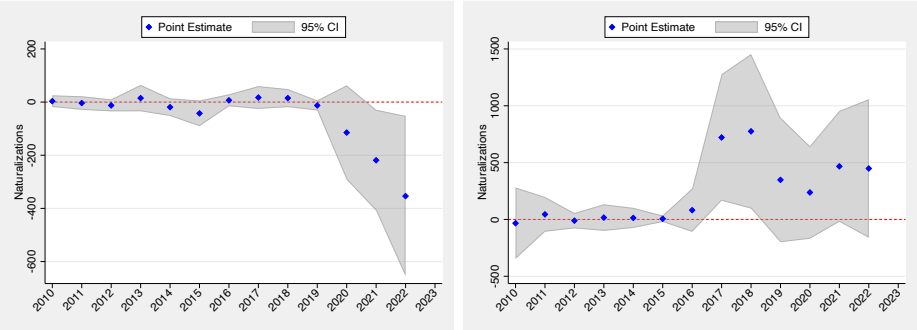
		ATT		
Country	Period	DID	SDID	t-diff
Mexico	2016-22	387 (193.8)	439 (197.0)	0.00
Mexico	2020-22	74 (60.4)	22.2 (163.4)	0.00
China	2020-2022	-150.4 (62.3)	-229 (95.7)	0.00
China	2016-2019	103.9 (25.6)	151.1 (47.0)	0.00

3.10 Event Analysis

We further investigate the results of the DID by using an event analysis approach. While the DID and SDID approaches capture the average treatment effect by comparing changes over time between treated and control groups, event analysis provides a year by year

comparison of the effects of the event, offering a more in-depth idea of the changes. All results follow the trends that DID suggest, with the caveats that some years are not signficant at 5% levels (but all are at 10%).

Figure 3.6: Event Analysis for China (left) And Mexico(right)



3.11 Discussion

Political engagement at the electorate level is an important step in the integration process of immigrants, and whose pre-requisite in most countries is naturalization. Naturalization has been shown to develop political integration by increasing formal political participation, political knowledge, and political efficiency (Hainmueller, Hangartner, & Pietrantuono, 2015). Furthermore, naturalization grants foreign born individuals nearly all the benefits, rights, and responsibilities as native born citizens, including the right to vote and full protection from deportation. In the case where immigrants may perceive discrimination, it is not straightforward whether this will hinder or increase their political participation and likelihood on integrating into the electorate.

In this paper, we test the hypothesis that those that are more directly targeted by anti-immigrant rhetoric increased voting turnout after 2016 and change their naturalization numbers during the Trump administration. In the case of naturalization, we find that there's a positive effect for Mexicans, one of the most targeted and largest immigrant groups that has been previously shown to become the most politicized by Trump's rhetoric. The naturalization effect is in the opposite direction for Chinese citizens, who, given their

particular situation and socio-demographics, may have better outside options. But also face the choice of renouncing their citizenship to become US citizens.

Finally, we find a positive effect in voting turnout for both Mexicans and Chinese in 2016 and 2020, respectively, relative to other immigrant groups, even when using other self-identified Hispanics as a control group.

These results are in line with a social identity theory in which the most salient and politically targeted group, i.e. Mexicans, Asians and Chinese, increased their voting turnout in a political campaign in which their identity became more politicized. It also indicates that increases in naturalizations may have been used in order to provide some protection from the potential consequences of Trump's presidency for Mexicans. Surprisingly, the effect does not seem to have spilled over to other closely related immigrant groups from other Latin American countries, perhaps because their identity was not particularly triggered or become salient from Trump's attacks, since most of these were specific to Mexicans and Mexico. Additionally, the null effects found for individuals belonging to Muslim countries could be due to the fact that this group of countries that was banned from traveling to the U.S was not clearly defined, and nationalities kept being added and removed from this group throughout Trump's presidency (See appendix A2). On the other hand, if this group faced both political systematic discrimination (which is hypothesized to increase political behavior) and interpersonal discrimination (e.g. in the form of personal hate crimes, which is hypothesized to decrease political behavior) (Oskooii, 2016), the net effect may be null.

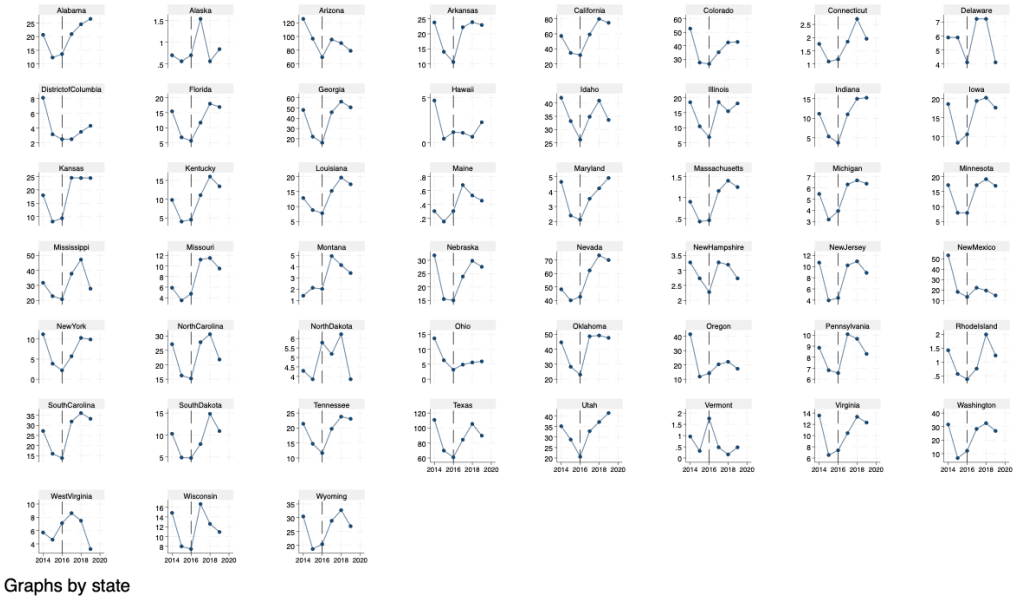
3.12 Appendix

Table A1: List of Countries of Birth of Naturalized Citizens Included in Sample

Afghanistan	Colombia	India	Netherlands	Switzerland
Albania	Congo, Democratic Republic	Indonesia	Netherlands Antilles (former)	Syria
Algeria	Congo, Republic	Iran	New Zealand	Taiwan
American Samoa	Costa Rica	Iraq	Nicaragua	Tajikistan
Angola	Cote d'Ivoire	Ireland	Niger	Tanzania
Anguilla	Croatia	Israel	Nigeria	Thailand
Antigua and Barbuda	Cuba	Italy	Norway	Togo
Argentina	Cyprus	Jamaica	Oman	Tonga
Armenia	Czech Republic	Japan	Pakistan	Trinidad and Tobago
Aruba	Czechoslovakia (former)	Jordan	Palau	Tunisia
Australia	Denmark	Kazakhstan	Panama	Turkey
Austria	Djibouti	Kenya	Papua New Guinea	Turkmenistan
Azerbaijan	Dominica	Korea	Paraguay	Turks and Caicos Islands
Bahamas	Dominican Republic	Kuwait	Peru	Uganda
Bahrain	Ecuador	Kyrgyzstan	Philippines	Ukraine
Bangladesh	Egypt	Laos	Poland	United Arab Emirates
Barbados	El Salvador	Latvia	Portugal	United Kingdom
Belarus	Eritrea	Lebanon	Qatar	Uruguay
Belgium	Estonia	Liberia	Romania	Uzbekistan
Belize	Ethiopia	Libya	Russia	Venezuela
Benin	Fiji	Lithuania	Rwanda	Vietnam
Bermuda	Finland	Luxembourg	Saint Kitts and Nevis	Yemen
Bolivia	France	Macau	Saint Lucia	Zambia
Bosnia and Herzegovina	French Polynesia	Macedonia	Saint Vincent and the Grenadines	Zimbabwe
Botswana	Gabon	Madagascar	Samoa	
Brazil	Gambia	Malawi	Saudi Arabia	
Brunei	Georgia	Malaysia	Senegal	
Bulgaria	Germany	Mali	Serbia and Montenegro (former)	
Burkina Faso	Ghana	Malta	Seychelles	
Burma	Greece	Mauritania	Sierra Leone	
Burundi	Grenada	Mauritius	Singapore	
Cabo Verde	Guatemala	Mexico	Slovenia	
Cambodia	Guinea	Micronesia, Federated States	Somalia	
Cameroon	Guinea-Bissau	Moldova	South Africa	
Canada	Guyana	Mongolia	Soviet Union (former)	
Cayman Islands	Haiti	Montserrat	Spain	
Central African Republic	Honduras	Morocco	Sri Lanka	
Chad	Hong Kong	Mozambique	Sudan	
Chile	Hungary	Namibia	Suriname	
China, People's Republic	Iceland	Nepal	Sweden	

Notes: In the analysis, only countries at the observation level that are present throughout the whole time period in their respective samples are used.

Figure A1: ICE Arrest Per Country of Birth per 100,000 State Capita: 2015-2017 Mexico and Other Top Countries



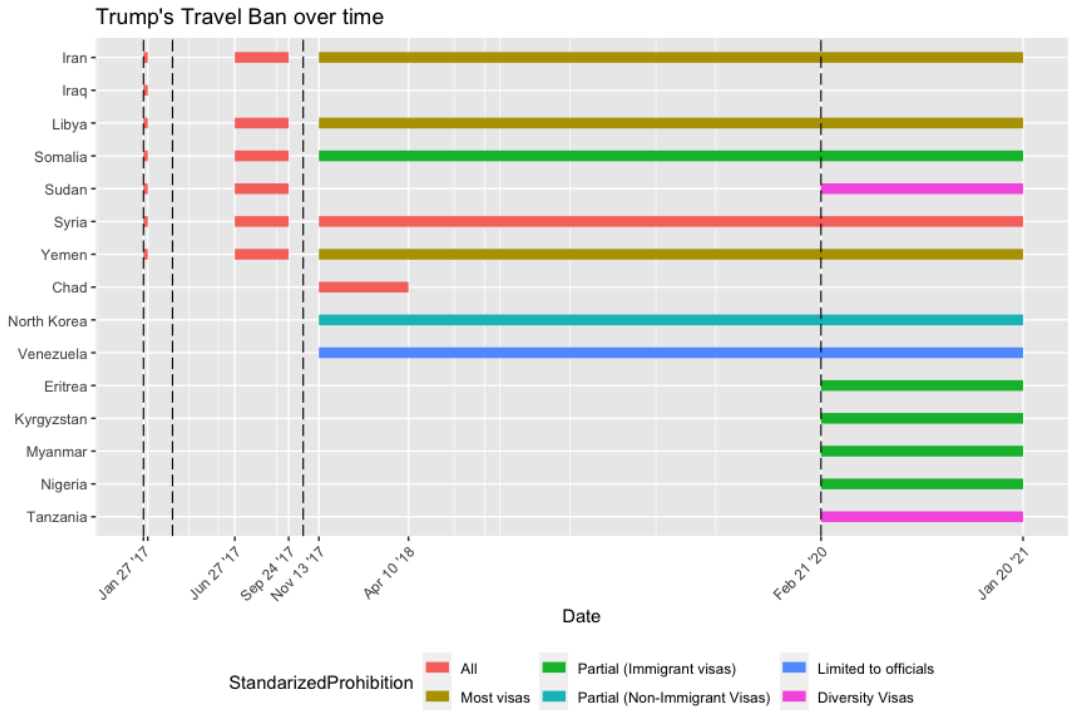
Notes:

Table A2: Linear Probability Model Coefficients on 2018*Mexican. Effect on Reported Voting Turnout in 2018 Midterm Elections.

	(1) voted	(2) voted	(3) voted	(4) voted	(5) voted
2018*mexican	-0.00287	-0.0215*	-0.0207*	-0.0207	-0.0207
	(0.0120)	(0.0110)	(0.0116)	(0.0213)	(0.0289)
mexican	-0.108***				
	(0.0165)				
N. of observations	35066	35066	35066	35066	35066
year dummies	Yes	Yes	Yes	Yes	Yes
country-of-birth dummies		Yes	Yes	Yes	Yes
state dummies			Yes	Yes	Yes
s.e. clustering				state	country & state

Notes: Observations at the individual-year level. Heteroskedasticity-robust standard errors clustered and shown in parenthesis at the country of birth level,except for the last 2 specifications. Pre-years include election years 1994-2014. Sample is restricted to naturalized citizens that answered yes/no to having had voted (excludes non-responses and missings). Excludes Non-Mexican Hispanics and those born in Muslim countries affected by the 2017 travel ban. * p ¡ 0.10, ** p ¡ 0.05, *** p ¡ 0.01.

Figure A2: Trump's Travel Ban



Notes: Derived from the Executived orders and Presidential Decrees

Table A3: Linear Probability Model Coefficients on 2016/8*Hispanic. Effect on Reported Voting Turnout in 2016 Presidential Election and 2018 Midterm Election.

	(1)	(2)	(3)	(4)	(5)
	voted	voted	voted	voted	voted
2016*hispanic	-0.0288	-0.0405	-0.0375	-0.0375	-0.0375
	(0.0328)	(0.0298)	(0.0296)	(0.0274)	(0.0370)
hispanic	0.0604**				
	(0.0239)				
N. of observations	23024	23024	23024	23024	23024
year dummies	Yes	Yes	Yes	Yes	Yes
country-of-birth dummies		Yes	Yes	Yes	Yes
state dummies			Yes	Yes	Yes
s.e. clustering				state	country & state

	(1)	(2)	(3)	(4)	(5)
	voted	voted	voted	voted	voted
2018*hispanic	0.0401	0.0199	0.0232	0.0232	0.0232
	(0.0269)	(0.0242)	(0.0243)	(0.0253)	(0.0353)
hispanic	0.00135				
	(0.0305)				
N. of observations	27397	27397	27397	27397	27397
year dummies	Yes	Yes	Yes	Yes	Yes
country-of-birth dummies		Yes	Yes	Yes	Yes
state dummies			Yes	Yes	Yes
s.e. clustering				state	country & state

Notes: Observations at the individual-year level. Heteroskedasticity-robust standard errors clustered and shown in parenthesis at the country of birth level, except for the last 2 specifications. Pre-years include election years 1996-2012. Sample is restricted to naturalized citizens that answered yes/no to having had voted (excludes non-responses and missings). Excludes Mexican Hispanics and those born in Muslim countries affected by the 2017 travel ban. * p ¡ 0.10, ** p ¡ 0.05, *** p ¡ 0.01.

Table A4: State-wide Naturalizations by Grouped Country of Birth: Highlighting China after 2020

Country	Years 2010-2015			Years 2016-2019			Years 2020-2023		
	Mean	StD	Obs	Mean	StD	Obs	Mean	StD	Obs
Mexico	1,837	(5,854)	306	2,316	(7,311)	204	2,109	(6,575)	153
Latin America	133	(845)	8,568	141	(889)	5,712	150	(1,055)	4,284
Iran, Libya, Somalia, Sudan, Syria, Yemen	71	(364)	1,836	66	(310)	1,224	93	(408)	918
China, Philippines, Vietnam, India, Korea, Japan	506	(1,515)	1,836	553	(1,583)	1,224	554	(1,601)	918
Other countries	41	(153)	33,660	42	(150)	22,440	46	(172)	16,830
Philippines, Vietnam, India, Korea, Japan	480	(1,455)	1,530	515	(1,497)	1,020	558	(1,631)	765
China	636	(1,784)	306	741	(1,950)	204	533	(1,447)	153

Notes: Standard deviations in parenthesis. Observations at the country-of-birth state-year level. Samples consists of balanced panels. * See Figure 1 for the countries included.

Table A5: Linear Probability Model Coefficients on 2016/8*MuslimTravelBan. Effect on Reported Voting Turnout in 2016 Presidential Election and 2018 Midterm Election.

	(1)	(2)	(3)	(4)	(5)
	voted	voted	voted	voted	voted
2016*TravelbanMusl	0.0273	0.0216	0.0279	0.0279	0.0279
	(0.0409)	(0.0391)	(0.0387)	(0.0396)	(0.0470)
TravelbanMusl	-0.0317				
	(0.0280)				
N. of observations	19367	19367	19367	19367	19367
year dummies	Yes	Yes	Yes	Yes	Yes
country-of-birth dummies		Yes	Yes	Yes	Yes
state dummies			Yes	Yes	Yes
s.e. clustering				state	country & state

	(1)	(2)	(3)	(4)	(5)
	voted	voted	voted	voted	voted
2018*TravelbanMusl	0.0846	0.0410	0.0412	0.0412	0.0412
	(0.0526)	(0.0315)	(0.0357)	(0.0484)	(0.0517)
TravelbanMusl	-0.0568*				
	(0.0299)				
N. of observations	23086	23086	23086	23086	23086
year dummies	Yes	Yes	Yes	Yes	Yes
country-of-birth dummies		Yes	Yes	Yes	Yes
state dummies			Yes	Yes	Yes
s.e. clustering				state	country & state

Notes: Observations at the individual-year level. Heteroskedasticity-robust standard errors clustered and shown in parenthesis at the country of birth level, except for the last 2 specifications. Pre-years include election years 1996-2012. Sample is restricted to naturalized citizens that answered yes/no to having had voted (excludes non-responses and missings). Excludes Mexican and Non-Mexican Hispanics. * p ¡ 0.10, ** p ¡ 0.05, *** p ¡ 0.01.

Figure A3: Graphical results of the DID

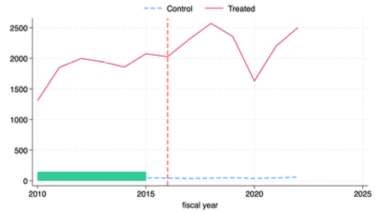


Figure: Mexico T:16-23

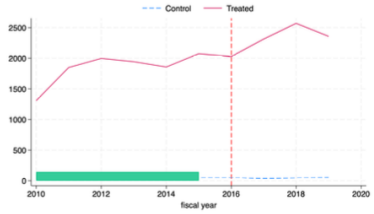


Figure: Mexico T:16-19

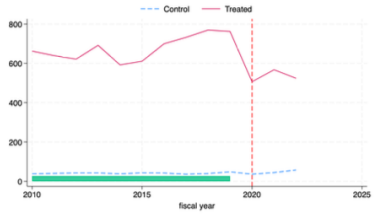


Figure: China

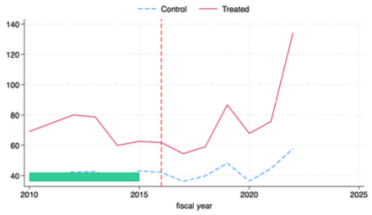


Figure: Travel Ban

Figure A4: Graphical results of the SDID

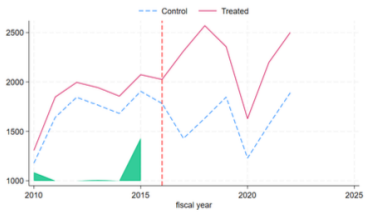


Figure: Mexico T:16-23

Figure: Mexico T:16-19

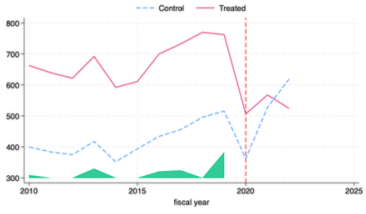


Figure: China

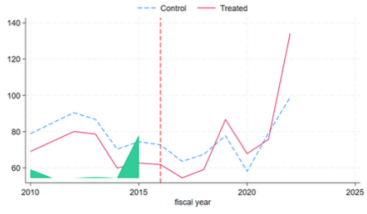


Figure: Travel Ban

Notes: Graphical results derived from the `sdid` command

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